DOMESTIC ENGINEERING

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Plumbing and Heating Symbols

In this page is shown a reproduction of an illustrated system of symbols recommended by the Minneapolis Architectural Club as combining all required in ordinary plumbing and heating practices in connection with architect's plans.

For a number of years architects have been contemplating a system of symbols for plumbing and steam-fitting, and many of the larger offices have already adopted their own methods of noting piping, valves, fittings and fixtures on their plans. It is the opinion of "Domestic Engineering" that what is now needed is that these symbols be standardized so as to be used on all plumbing and heating plans drawn by architects, as a culmination of the idea that these symbols can be of advantage to the plumber and steam-fitter. The desirability of symbols on architect's plans should be most readily agreed to by the trades, inasmuch as estimating is thus made much easier, and there is then provided a means for the suggestions of the plumbing and heating contractor in the way of making the work more satisfactory than as designed by the architect.

PLUMBING SYMBOLS · HEATING SYMBOLS

ADOPTED BY THE MINNEAPOLIS ARCHITECTURAL CLUB FOR ARCHITECTS, CONTRACTORS & BUILDERS

SYMBOL	DESIGNATION
	IRON SEWER PIPE
	VITRIFIED TILE PIPING
—I—I—I—I—	COLD WATER PIPING
—II—II—II—II—	HOT WATER PIPING
—III—III—III—III—	HOT WATER CIRCULAT'N
	FLOOR DRAIN
S	SINK
SS	SLOP SINK
SC	SILL COCK
C.W.	COLD WATER
H.W.	HOT WATER
LAV.	LAVATORY - B.N. BASIN
C&W	CHECK & WASTE
COND.	CONDUCTOR PIPE
D.W.F.	DRINKING WATER FOUNTAIN
F.H.R.	FIRE HOSE REEL
L.S.	LIVE STEAM CONNECTION
G	GAS PIPING
G	CEILING OUTLET FOR GAS LIGHTING SYSTEM
G	FLOOR OUTLET FOR GAS
G	BRACKET OUTLET FOR GAS LIGHTING SYSTEM
G	HEATING OUTLET - GAS
C.A.	COMPRESSED AIR PIPING
V.C.	VACUUM CLEANING PIPING
	SOIL & WASTE RISER
	VENT RISER

SYMBOL	DESIGNATION
	STEAM MAIN
	RETURN MAIN
T	TEMPERATURE CONTROL PIPING
T	TEMPERATURE CONTROL THERMOSTAT
	FRESH AIR OPENING
	VENT OPENING
	VALVE
	FLANGE UNION
	SCREWED FITTING
	FLANGED FITTING
	RETURN RISER
	STEAM RISER
	RADIATION ON CEILING
	WALL RADIATION
	RADIATOR OR
H	HEAT FLUE
V	VENT FLUE
	CHECK VALVE
	GLOBE VALVE
	CROSS
	GATE VALVE
	TEE
	COCK
	SQUARE FEET OF RADIATION

PIPES SHOWN WITH DOUBLE LINE MAY BE PENCIL-TINTED TO PRINT BETWEEN LINES

The accompanying symbols recommended by the Architectural Club of Minneapolis, may or may not be a complete system in the opinion of many plumbers and steam-fitters. "Domestic Engineering" would be glad to know what its readers think of these symbols as illustrated.

Are symbols an advantage?

Is the system illustrated here complete?

Is it comprehensive?

A discussion in the columns of "Domestic Engineering" of this idea may be of great advantage to the trades.

Send in your views for publication.

OBITUARY.

Albert T. Leach.

Albert T. Leach, treasurer of Domestic Engineering Co., and secretary and treasurer of the Kenfield-Leach Co., was killed in an automobile accident near Valparaiso, Ind., July 4. John J. Moroney, president of the Chicago Brick Machinery Co., who was with Mr. Leach, received a severe wrench to his back and neck and was confined several days in a Chicago hospital. Mr. Leach's chauffeur was the most seriously hurt, the others in the car escaping with slight bruises.

Mr. Leach was taking a party of friends to Michigan City, Ind., in his car to spend the holiday. In an effort to avoid a motorcyclist, who had lost control of his machine, the chauffeur attempted to make a sudden turn. The car was hurled into a ditch and upset. Mr. Leach was pinioned beneath, both of his legs being broken and his body crushed. He died instantly.

The Late Albert T. Leach.

Mr. Leach was one of the best known men in the publishing business in Chicago, and the hundreds of telegrams and letters expressing sympathy, from all over the country, received by his widow and business associates, attest to the high esteem in which he was held.

As a publisher, Mr. Leach's constant aim was to make "Domestic Engineering" the standard of excellence in trade publications and the magazine is so recognized today, in no matter what line of industry the comparison may be made.

The Kenfield-Leach interests are greater, however, than this one publication. From the two small presses Mr. Leach found when he began his career with the concern in 1899, there has grown a publication business that covers seven floors of a building erected for the exclusive use of the varied interests. As an evidence of the magnitude of the business since his connection with the firm it may be stated that nearly one hundred trade publications are printed regularly from the plant.

Mr. Leach was born July 30, 1876, at Springfield, Mo., He began his business career as a printer's apprentice. It was not long before he gave indication of his exceptional ability and soon was conducting a printing establishment of his own in Carthage, Mo.

In 1899 Mr. Leach began with the firm that was later designed to bear his name. This was the Windsor-Kenfield Publishing Co. He was given charge of the printing department—at that time a comparatively small business. Under his guidance the printing end grew until today it is one of the largest plants of its kind in the west.

Three years after Mr. Leach joined his fortunes with those of the Windsor-Kenfield Publishing Co. he was made manager of the concern, and later secretary and treasurer, his name being included in the trade title as it stands today.

Coming as he did from a small country town, barely fourteen years ago, Mr. Leach's rise in the business world was phenomenal. But he was a climber and did things in a big way. He was a tireless worker, a born executive, and his untimely death cut short a career that was destined to bring him greater distinction in the field he had chosen.

Mr. Leach married Miss Clara Harris of Harris, Mo., in 1904. The widow and his two brothers are the only immediate members of the family who survive him.

Fred Adee.

Fred Adee, founder of the Fred Adee Co., 44 Cliff street, New York City, dealer in plumbing supplies, died at his home in that city on Sunday, June 30th, in his 83rd year. He retired from business some time ago. A widow, a son and two daughters survive him.

John Marshall Cullis.

John Marshall Cullis, formerly engaged in the plumbing business at Buffalo, N. Y., died July 2nd, at his home in Yonkers, N. Y. His wife and one son survive him.

John Maher.

John Maher, of the plumbing firm of Maher Bros., Cincinnati, O., died at his home in that city on June 21st, in his 39th year. His wife and his brother survive him.

Elbridge A. Walker.

Elbridge A. Walker, for many years engaged in the plumbing business in the Auburndale section of Newton, Mass., died at the Newton hospital on the morning of July 1, after a long illness. He is survived by a widow.

Brinner H. Sherman.

Brinner H. Sherman, one of the oldest and best known residents of Williamstown, Mass., and for more than a quarter of a century engaged in the plumbing and hardware business in that town, died last week in his 61st year. He was born in Williamstown and was a son of one of the oldest families. A year and a half ago failing health forced Mr. Sherman to retire from active business and his son, F. H. Sherman, took charge.

Analysis of the Principal Provisions of the Plumbing Codes of Thirty-seven of the Principal Cities in the United States

By Thomas S. Ainge, Sanitary Engineer, Lansing, Michigan

[Explanatory.—During the past two years, the duties of the writer, as State Medical Inspector, have kept him on the road during a considerable portion of his time, and the continuation of this series of articles has been, necessarily, delayed. It is hoped that nothing will turn up to prevent an early completion of the series, so that the purpose of the same may be realized in the evolution of a model code such as would be suited to the needs of every locality in this country.

At the commencement of the series, the writer was not able to secure copies of the codes of the cities of Cleveland, Los Angeles and Memphis, but he has since received copies of the same and they have been considered in the present article.

Prior to the preparation of the present article, an effort was made to secure information relative to changes which have occurred in the codes during the past two years, and replies were received from all the cities excepting Buffalo, Los Angeles, Louisville, New Haven and Newark. From the replies received, it was found that the city of Allegheny had been incorporated with the city of Pittsburg, and the further consideration of the Allegheny code has, therefore, been discontinued. It was also found that the codes of the cities of Cleveland, Cincinnati, Columbus and Toledo have been supplanted by the Ohio State Building Code, and the latter has, therefore, been used in the preparation of the continuation of this series of articles.]

Trap-Vents (Continued).*

In the codes under consideration, provision is made for the proper termination of the vent pipes at the base in but seventeen instances. In a few of the codes, the requirement is, very properly, made that the horizontal vent pipes have an upward inclination to prevent the accumulation of moisture in the same.

Plumbing Fixtures and Accessories.

The specifications relative to Plumbing Fixtures and Accessories are shown in Exhibit X, which will be published in a subsequent issue.

Open Plumbing.

In these days of sanitary plumbing fixtures, with their attractive and, in some instances, elegant exteriors, it would scarcely seem necessary to prohibit, by code, the installation of fixtures, such as were in vogue during the last and previous decades, which, by reason of the unattractiveness of their exteriors, were concealed from view by wooden casings, and thus created a suitable place for the accumulation of filth and a harbor of refuge for vermin of various kinds. There are, however, very many antiquated plumbing fixtures, with their wooden enclosures, still in use in the older buildings, and there is an ever-present possibility that, so long as there is any wear left in these fixtures, they will be repaired or remodeled from time to time, and the further possibility that they may be removed to and re-installed in some other place. For these reasons, it would be the part of wisdom to insert in every plumbing code a specific requirement for open plumbing in every instance.

By reference to exhibit X, which will be published with the next installment of this article, it may be seen that, in the codes under consideration, open plumbing is required for all fixtures in but twelve instances, and, in but twelve instances, no specification is found relative to open plumbing for any fixture. In the remaining eleven codes, specifications are found relative to open plumbing for one or more classes of fixtures, of which water closets have received the greatest amount of attention.

Water Closets.

Prohibited locations for.—Water closets are frequently located in dark or unventilated rooms, apartments, or compartments, and in certain other unsuitable places; and, when so located, they will usually be found to be in a filthy condition and the source of foul odors. For this reason, every plumbing code should designate where, and under what conditions, water closets may be installed. In the codes under consideration, all but seven contain some specification relative to the location of water closets, but many of the specifications are not sufficiently comprehensive and present a striking lack of uniformity. Thus, in eleven codes, the installation of water closets in an unventilated room or compartment is prohibited, but, in two instances, proper local ventilation of the fixtures will be deemed sufficient. In each of these instances, the all-important question of lighting seems to have been overlooked, and there is no standard laid down for the ventilation. Again, in two of the codes, the prohibition relates to unventilated or poorly lighted apartments, but there is no standard provided by which to determine what would be considered good ventilation or lighting. Again, in four of the codes, ventilation or lighting, or both, by means of a window, or an air or light shaft, is required, but, in one instance, a system of ventilation which will change the air of the room, at normal temperature, at least six times per hour will be deemed sufficient; and, in all of these four codes, there is no standard laid down for proper lighting and ventilation by means of the windows or the air and light shafts. Even the eight codes which contain specific requirements as to the location, lighting, ventilation and general arrangement of the rooms or other places wherein water closets may be located present a variety of standard dimensions for windows and light and air shafts, as will be shown later in the chapter on "Toilet Rooms."

It would scarcely seem necessary to specify that water closets be not located in sleeping rooms, nevertheless this

*This portion of the article on Trap-Vents was left over from the installment which was published on January 22, 1910, and has reference to the codes which were then being considered.

is done, and very properly, too, in four of the codes. The same rule should also apply to living rooms, particularly in those rooms where food is prepared for human consumption, but this is specified in but two of the codes. Although living or sleeping rooms are not specifically mentioned as prohibited locations in the codes of the cities of Memphis and Rochester, it is believed that the specifications in these codes relative to this question are intended to cover such locations.

A cellar or basement may or may not be considered a suitable place for a water closet in proportion to the facilities for lighting, ventilation and cleansing of the room or compartment; and in many buildings of a public character, where proper lighting and ventilation can be secured, and where proper attention will be given to the rooms, there would be no serious objection to the location of water closets in such places. There are, however, very many cellars and basements, both in private and public buildings, which, without considerable alterations, would be entirely unsuited for this purpose, and, for this reason, every plumbing code should contain specific rules governing the use of such places for toilet rooms. Nine of the codes under consideration prohibit the location of water closets in cellars or basements, but, in four of these the prohibition is conditional; and, in the majority of these nine codes, the prohibition has reference only to the general water closet accommodation in tenements and lodging houses.

The location of water closets in areas under sidewalks should be prohibited, because such places are uniformly dark, and, as previously stated, a dark water closet compartment means a dirty and foul smelling place. Further, as the danger from frost in such locations would be very great, the water closet apparatus would necessarily have to be of the non-freezing type, with hopper bowl; and the probability of such a bowl becoming filthy, even under the best conditions of lighting, would be very great. While the general specifications of a number of the codes under consideration seem to prohibit the location of water closets under sidewalks, specific mention is made of such places in but one instance, and then only in reference to the water closet system of tenements or lodging houses.

Many of the codes permit the location of water closets in outbuildings, and specify, more or less completely, the types of fixtures which may be used, the manner of installation of the fixtures and the general arrangement of the outbuildings. In one code, however, water closets outside of buildings are prohibited; in another code, the prohibition extends to the yards of new buildings or to any point which is within eight feet of an existing building; and in two other codes, to porches.

Prohibited fixtures.—In all but three of the codes, the use of some one or more type of water closet is prohibited, conditionally or otherwise.

Among the water closets which are usually prohibited in a code, five types—Pan, Plunger, Valve, Washout and Hopper—stand out prominently as insanitary fixtures, and all but the last mentioned type have practically disappeared from the market. At this date, a Pan, Plunger or Valve closet would be considered a rare specimen; and it is a question if very many of the younger members of the plumbing fraternity have ever seen these types of fixtures, yet their use is specifically prohibited in a large number of the codes under consideration. By the wording of Section 3 of Article XI of the Louisville code, at the first glance, it would seem as though Pan closets are prohibited in that city only when the trap is under the floor, but as the trap of such a closet must, of necessity, be under the floor, the intent of the code is evidently not what it might be construed to be.

There are very many closets of the Washout type still in use and they are uniformly found to be in a foul condition. For this reason, their further use should be prohibited, at least in all new or re-constructed work. In the codes under consideration, this is done in but a few instances, in contradistinction to the very general prohibition of the obsolete and almost forgotton types of fixtures mentioned in the preceding paragraph.

The use of Hopper closets, of various types, is prohibited in very many of the codes, but, in many instances, the prohibition is conditional. As there is no form of Hopper closet which can be considered a sanitary fixture, the prohibition should include every form of closet of this type, and their use should be limited to anti-freezing closets of the best type in locations where a water closet is absolutely necessary and where the use of any other type of closet would not be practicable.

In a number of the codes, a general prohibition is made of all water closets which come under one or more of the following heads:

Those having invisible seals.

Those having an unventilated space.

Those in which the walls are not thoroughly washed at each discharge.

Those in which the discharge or the maintenance of the seals depends upon a mechanical movement.

Those in which the venting, back-venting, or local venting is to be made in any other manner than that prescribed for the generally approved types.

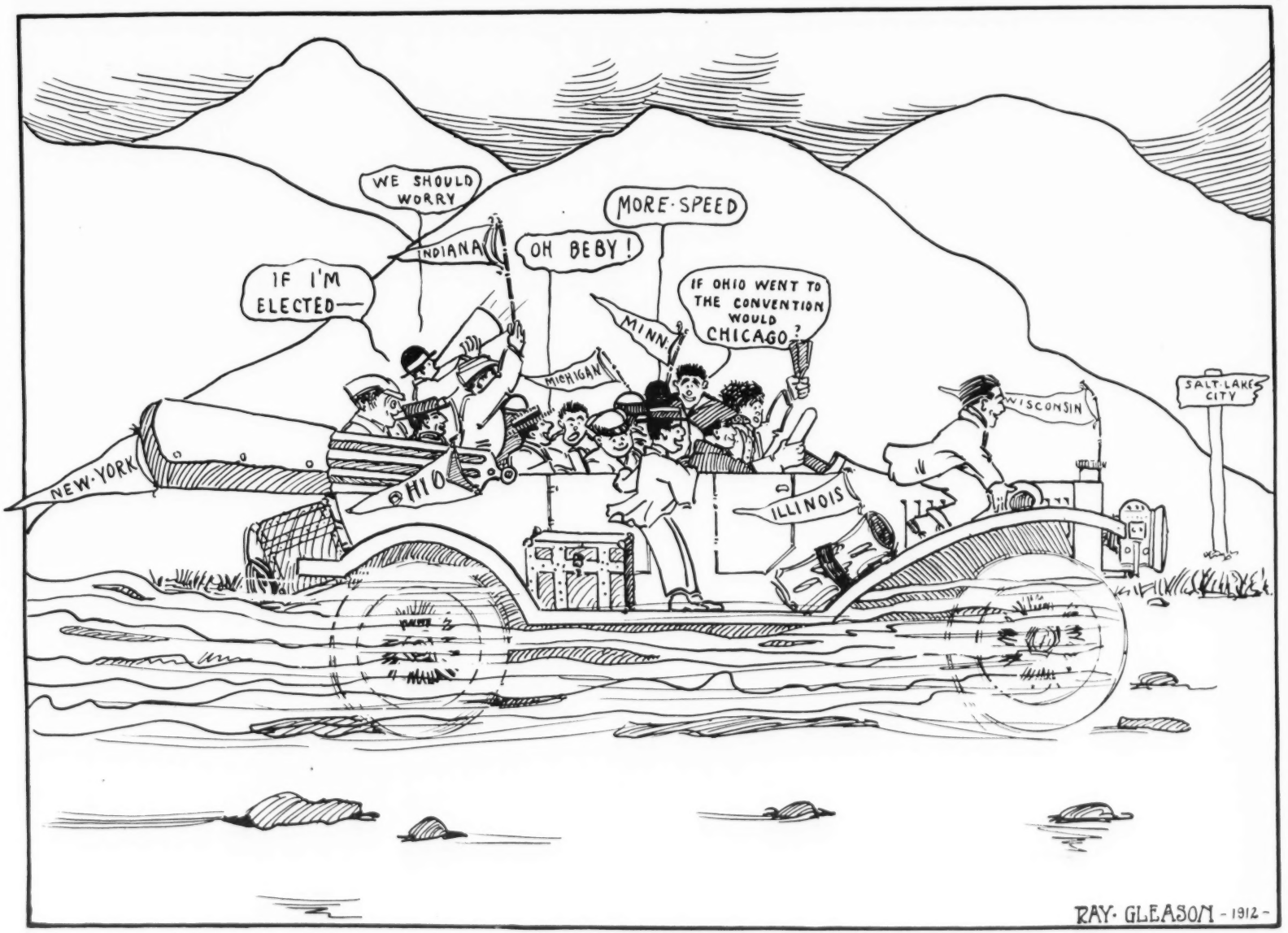
In this connection, it is suggested that it would not be a difficult matter to reduce the question of the prohibition of a large number of insanitary and obsolete water closets to one comprehensive paragraph or section in the codes, and this should be done in the interests of simplicity and for the prevention of confusion.

The use of water closets of the range type, under various designations, is prohibited by seventeen codes, but, in several instances, their use is permitted in outbuildings under certain conditions.

According to Webster, the term "Latrine," as used in many of the codes in reference to the range type of water closets, is a misnomer; and as there may be upon the market meritorious fixtures of the range type which are now included in the codes with insanitary closets of the Trough and other types under the general term of "Latrine," a weeding out and a change in the name or designation of those fixtures which might be considered worthy of approval would seem to be necessary.

The use of Dry closets, of the Smead type, is, very properly, prohibited in six of the codes; and in view of the general and unqualified condemnation of this type of closet during the past fifteen or twenty years, a more general prohibition of their use, by code, would scarcely seem necessary, nevertheless, the prohibition should be included in every code until such apparatus are no longer manufactured or offered for sale.

Floor connections.—It is scarcely necessary to state that the floor connection of a water closet should be made in such a manner that it will be absolutely air-tight when newly made and remain so under the varying conditions which tend to break such joints. When newly made, a rigid connection between the floor flange and the vertical soil pipe, and a putty joint between the floor flange and the closet bowl, may pass inspection and withstand the usual tests, but they would not be expected to with-



"They Are On Their Way"

stand, for any considerable length of time, the effects of expansion and contraction of the vertical soil pipe, or a settlement of the building such as may be expected to occur in all new work. It is an undeniable fact, however, that, in very many instances, the floor connections of water closets of the ordinary type are made without regard to permanency, and, for this reason, every code should contain full and explicit specifications upon this question. In some of the codes under consideration, this is done, but, in very many instances, the specifications are lacking in some one or more important details; and twelve of the codes contain no specifications whatever upon this important subject.

In buildings of ordinary construction, the usual specifications for a substantial floor joint for a water closet of the ordinary type include:

1. A flexible connection between the vertical soil pipe and the floor flange.
2. A floor flange, usually of brass, securely fastened, by solder or by a screw joint, to the branch of the soil pipe, and fastened to the floor by screws or bolts.
3. A gasket of durable and flexible material between the floor flange and the closet bowl.
4. The bolting of the floor flange to the flange of the closet bowl.

Measured by this standard, we find that, in the codes under consideration which contain some specification relative to the floor joints of water closets, a flexible connection between the vertical soil pipe and the floor flange is specified in but one instance; that brass floor flanges are specified in but twenty instances, in nine of which the specified thickness varies from one-eighth to three-sixteenths of an inch and in eleven of which no thickness is specified; that the method of securing the floor flange to the branch of the soil pipe is specified in but seventeen instances; that the fastening of the floor flange to the floor is specified in but three instances; that the nature of the material for making the joint between the floor flange and the closet flange is specified, by name, in but eleven instances; and that the bolting of the floor flange to the closet bowl is specified in but sixteen instances.

In the past few years, a number of patented devices have been placed on the market for making the floor joints of water closets; and in view of the possibility that some of these devices, together with others which may be brought out from time to time, may be found to meet all requirements, every code should contain a clause permitting the use of such as may be found worthy of approval. This has been carried out in two of the codes under consideration.

Flushing apparatus.—In all but five of the codes, some one or more specifications are found relative to the flushing apparatus for water closets, but, in many of these, the specifications are incomplete.

In seven of the codes, the specifications require that closet bowls be provided with flushing rims; and the fact that the modern type of bowls are usually equipped with flushing rims may be taken as the reason for the omission of this requirement from many of the other codes.

In ten codes, water closet bowls with direct supply from the water mains are prohibited, but, in five of these, exceptions are made to this rule, principally in the case of those closets in which the flushing is accomplished by valves of the flushometer type.

In those codes in which the specifications call for the flushing of water closets by means of tanks or cisterns, the capacity of the same is not stated in thirteen instances; and in those codes in which the capacity of the tank or cistern is given, there are considerable variations, the capacities varying from three to ten gallons.

In the specifications relative to the sizes of the flush pipes of water closets, there is much greater unanimity, all but two of the twenty-three codes in which a size is specified agreeing upon a minimum of 1¼ in. In the Minneapolis code, an exception is made in the case of low down closets, the minimum size for which is 2 in. In the Providence code, for some reason which is not apparent unless it is intended to cover those water closets which are flushed directly from the main, the size of 1 in. is specified.

In the case of the ordinary flush tank, the possibility of the use of the tank for any other purpose than that for which it was intended would be very remote, nevertheless, a prohibitory clause to cover such a contingency is found in the codes of six of the cities under consideration.

In the case of flushing tanks which may not be used, iron tanks are prohibited in five of the codes and, in two of these, the use of automatic flush tanks is also prohibited.

In many of the larger cities, the water pressure is not adequate for the service of fixtures on the upper floors of certain buildings and recourse must be had in such cases to storage tanks and, probably, to the use of pumps or other apparatus for raising the water to the higher levels. This condition would be expected in all of the cities whose codes are under consideration, yet the question seems to have been overlooked in all but ten instances.

A rather unusual specification is found in the Chicago code, viz., that the purity of the water which is used for flushing water closets shall be equal to that of the city water. This is probably made necessary by some unusual condition which is met with in that city; and it may also be intended to secure the cleanliness of storage tanks in the taller buildings.

Notwithstanding that the use of water closets of the range type is permitted in many of the codes, with the exception of the Ohio State Building Code, which governs the cities of Cleveland, Cincinnati, Columbus and Toledo, there are no specifications in the codes governing the flushing apparatus of such fixtures.

Local ventilation.—In those sections of the country where the ventilation of the rooms and other places wherein water closets may be located by exterior windows during the winter months would be impracticable, in the absence of a positive system of ventilation of the toilet rooms, the installation of proper local ventilation in connection with the water closet bowls would be a distinct advantage, and this should always be insisted upon in the case of toilet rooms in buildings of a public or semi-public character.

From a perusal of the codes under consideration, it is apparent that the question of local ventilation of water closets is not considered to be of very great importance; and, in the nine codes in which some section or clause is found relative to this question, the specifications are principally optional in character. In the Ohio State Building Code, the specifications relative to this question are quite extensive, but, with the exception of closets of the range type, they do not cover the all important question of the arrangement and termination of the main flues.

(To be continued.)

The New Boarder—I'm on to these boarding games. Do you think I've lived in boarding-houses for ten years for nothing?

The Old Boarder—If you have I wish you'd put me next.—Exchange.

PLUMBING ACTIVITIES IN CITIES OF THE NORTHWEST.

Pictures on This Page Show, in a Measure, That There is Action in Connection with the Plumbing and Heating Trades of the Northwest.

The first illustration on this page is the plumbing establishment of Richard Sherwood at Billings, Mont. In an interview with a representative of "Domestic Engineering," Mr. Sherwood did not speak optimistically of conditions in his city. Mr. Sherwood said: "The plumbing business in Billings is a joke. The question here seems to be who will pay the largest premium for the opportunity of furnishing labor and material to the consumer.

"The fact that the premium is usually paid by the supply house makes the game all the more interesting. The supply houses are like fairy Godmothers, but their gifts come in the form of cast iron, lead, enameledware, etc. It is nothing short of remarkable that they will give a man credit for a thousand dollars worth of supplies whom they would not trust with a single dollar of currency.

"Indiscriminate giving of credit is destroying the plumbing business. The chance to lose the other fellow's money is too tempting to be overcome. The remedy is in the hands of the victims—the supply men—and all trade papers should do as "Domestic Engineering" has done consistently: first educate the trade as to the cost of doing business and then urge the refusal of credit to those who ignore this cost."

* * *

Berryman Bros., Inc., also of Billings, Mont., whose establishment is illustrated in the second picture, reported to "Domestic Engineering's" traveling representative, that they now have in course of completion contracts running into many thousands of dollars. These contracts include the heating and plumbing of St. Vincent's Hospital, of that city, the heating plant for the Northern Hotel, the installation of fifty lavatories in the Grand Hotel, plumbing equipment for the Peter Hoe flats, and contracts for plumbing and heating of several different residences.

* * *

The third picture on this page is of the McElroy Plumbing & Engineering Co's. plant at Billings, Mont., and was taken just as the men were ready to start work in the morning. This picture gives a fair idea of the force necessary to operate a first class plumbing and heating establishment in the West. This company occupies its own building, the first story being used for displaying a complete line of plumbing and electrical fixtures, with a complete machine shop in the rear of the office and show rooms. The basement space, 25 x 120 ft., is used for the general supply stock of pipe and fittings, electrical material, enameled goods, etc. Their large pipe threading machine is also located in the basement. This as well as the lathes, drill presses, planers, emery grinders and grindstone, located on the first floor, are operated by a five horse power electric motor. This company carries a stock of plumbing, heating and electrical goods of from eight to ten thousand dollars, and together with building, heavy tools and machinery, has a plant valued at more than twenty-five thousand dollars. This company also maintains an organization for the installation of city water systems, steam and hydro-electric plants and all kinds of concrete construction work.

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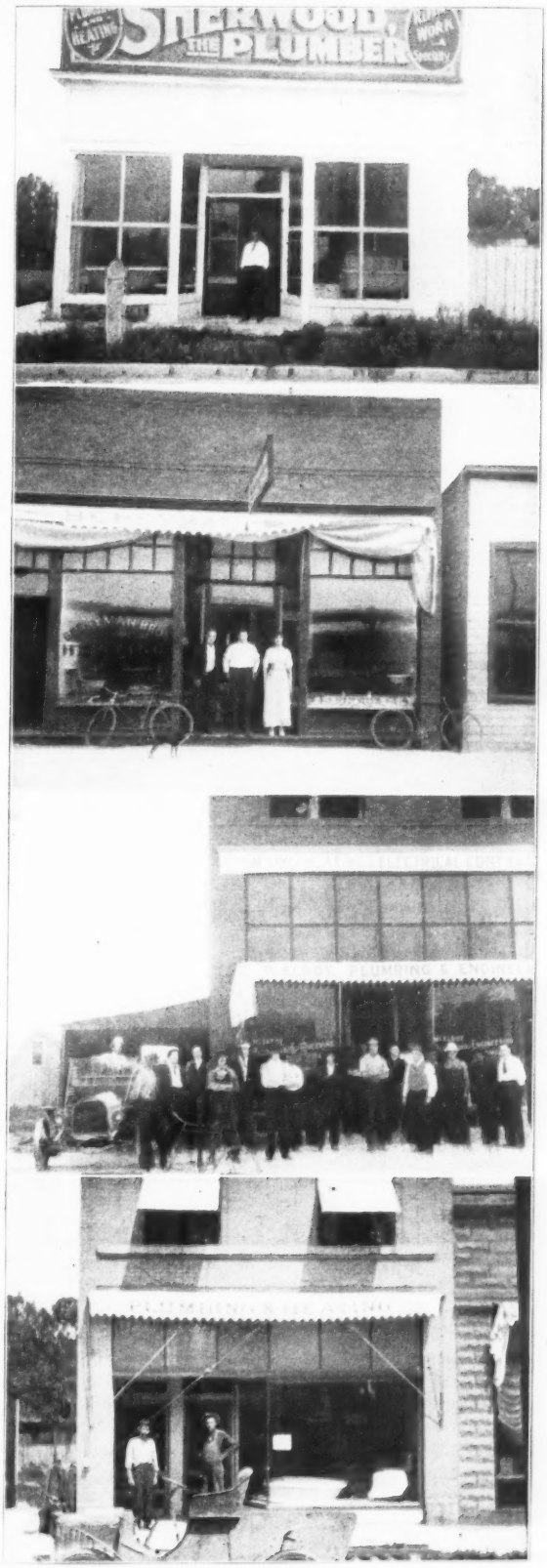
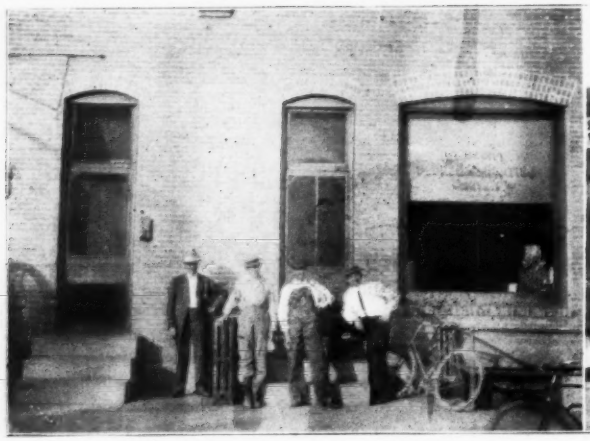
In the fourth picture on this page is shown the up-to-date plumbing establishment of Claude R. Cole at Miles



Where Action Prevails in the Plumbing Business of the Northwest.



City, Mont. Mr. Cole started in business in 1905 and the building now occupied was completed in January of this year. Mr. Cole now has an absolutely modern building and show room. He reports that since February of this year he has installed twelve complete bath room equipments and that he now has on hand contracts for the complete plumbing and heating of several different residences of Miles City. Mr. Cole also stated to "Domestic Engineering's" representative that prospects are most excellent for additional business during the summer, and that the plumbing business here is running on the best basis of any city in the state of Montana.

* * *

In the left hand picture on this page is shown the establishment of the Miles City Plumbing and Heating Co., of Miles City, Mont. The four men shown in the picture, reading from left to right, are Mr. Helow, western representative for Crane & Ordway; J. W. Szitnick and Geo. Harrigan, of the Miles City Plumbing and Heating Co., and Mr. Rothman, representing the Glauber Mfg. Co., of Cleveland, O. Mr. Szitnick, and Mr. Harrigan are the sole owners and proprietors of the Miles City Plumbing & Heating Co. and report contracts recently closed for the plumbing and heating equipments of several buildings which will keep their entire force active during the whole of the present summer.

* * *

The right hand picture on this page is of the Morehead Plumbing and Heating establishment at Morehead, Minn. This is one of the most modern plumbing and heating establishments in this section of the state.

THE METAL MARKET

ADVANCING PRICES FOR STEEL.

Further advances were made in the price of steel products during the week but these were on the lines not generally used: billets were marked up $1 a ton in the Philadelphia market and the larger sizes of wrought pipe were advanced about 2 points. The statistics of pig iron production for the first half of the year have been compiled and show that the production during June was 2,440,745 tons compared with 2,512,582 tons in May, there was no falling off in the rate of production for June had but 30 days while May had 31. It is interesting to note that the production in June this year was the largest ever recorded for that month.

The demand for steel and also for foundry making pig iron is large and it looks as though some of the contracts for delivery during July would not be filled. Some of the makers of heating supplies have been in the market the last week a sale of 5,000 tons to Abendroth Bros. being noted. The Central Foundry Co., also bought a round lot.

Prices are as follows:

No. 1 northern foundry, New York	$15.50@16.00
No. 2 X foundry, New York	15.25@15.75
No. 2 southern foundry, Birmingham	11.25@11.50
No. 2 southern foundry, Cincinnati	14.25@14.50
No. 2 northern foundry, Chicago	14.50

COPPER IN LESS DEMAND.

Consumers of copper both in this country and abroad have made no large purchases during the week. The market in London declined owing to the selling of speculators, and the nominal price in New York was reduced, but no transactions were made at the lower figures. The exports of copper during June were large, and the total exports for the first six months of this year, exceded those for the corresponding period, last year. It is believed, among consumers generally, and the selling agents share the same opinion, that there will be little business transacted until after the figures of the Copper Producers' Association are issued. The electrical industry in this country is going forward at a rapid rate, and an enormous amount of copper is going into that kind of construction. This demand is perfectly legitimate, and seems likely to continue for some time; but whether consumers will have to pay as much for the copper as they have in the last month, is another question. Many believe that the next buying movement will take place nearer the 15 cent level than the 20 cent. The nominal price at this writing is 17½ cents.

SPELTER.

Prices of spelter continue on a high level, and sales are made at 7.10 cents, New York. The reason for the high price is undoubtedly because of the scarcity of ore, which in turn is a result of the Mexican Revolution. There has been very little ore shipped across the border since the war started.

Competition in Public Contracts—III.

Paper by Cassius E. Gillette, Read before the American Society of Engineering Contractors and Here Reprinted by Special Permission of the Journal of A. S. E. C.

Conclusions.

It, therefore, seems that there is no practical reason to interfere with the application of the above principles. If there are any works for which practicable contracts cannot be made under those principles, such work should be done by buying materials under sound contracts and doing the work by hired labor and supervision under suitable civil service rules.

Suggested Law.

For simplicity and clearness these principles and incidental matters discussed herein could be conveniently embodied in state laws covering all public purchases, supplies and public constructions about as follows:

1. All expenditures of public money for supplies and construction work in amounts of $100 or more, shall be by formal written contracts. Purchases of less than $100 may be by written proposal and written agreement, duly filed.

2. No bid shall be asked until an actual appropriation of funds has been made for the work or supplies, and before bids are asked for public contracts, official itemized estimates of the cost of the proposed work shall be made and permanently filed in the office of the public official who invites the bids.

3. All public contracts involving an estimated cost of $5,000 or more shall be advertised in three local papers having the largest sworn circulation, and in at least one trade journal of suitable type, sufficiently far in advance of the opening of bids to give the most distant bidder in the State a reasonable opportunity to see the notice in time to submit a bid after due investigation.

Contracts for less than $5,000 shall be so advertised that every bidder residing in the municipality (or county) in which the supplies are to be delivered or work done shall have a reasonable chance to see the advertisement or receive the notice in time to submit a proper bid, and every official charged with the duty of purchasing supplies or making contracts must keep in his office lists of all dealers or bidders who request their names to be put upon such lists whenever such work and materials as they specify shall be desired by the official, and notice sent them in ample time to submit bids.

Purchases and contracts involving less than $100 may in emergencies be made by telephone, provided at least three bids be obtained, and the bids and prices be scheduled for public inspection, all the bids and the acceptance to be confirmed in writing.

In case of contracts for yearly supplies to be delivered as needed, purchases shall be by single items. The lowest bidder for each item shall be given the contract for that item, provided that, if any bidder does not thereby secure items for which the estimate for the year in question or the actual use for the preceding year shall amount to at least $100, such items may be awarded to the bidder who bid the next lowest for each item.

4. Specifications for public contracts shall in all cases comply with the following requirements:

(A) They shall be clear, definite and complete, expressed with words used in their dictionary meaning and showing exactly what is required in the literal use of the words which literal meaning must be used in carrying out the contract. If in any case questions arise in the execution of the contract that cannot be clearly answered by the specifications, the matter shall be adjusted by arbitration in which the contractor shall select one arbiter, the official the second, and they two shall choose a third. Provided, the contractor or any citizen or corporation doing business in the State shall have the right to take the matter into the proper court.

The advertisement, instructions to bidders, specifications and contract form must together cover all necessary information to bidders. They must be concise. Unnecessary verbiage and repetitions must be omitted. Everything must be said once, clearly, and once only.

(B) They shall be itemized in full detail, the unit of every kind of material entering into the structure appearing in the schedule of prices bid.

(C) No responsibility for contingencies shall be specifically put upon the contractor.

(D) The specifications shall be so worded and all arrangements and management concerning the bidding shall be such that all bidders shall be bidding upon fair terms for exactly the same structure or the same result, and upon terms of exact quality as to advantages or disadvantages in so far as the official calling for bids can control or embody it in the bid or award.

(E) The terms "discretion of the engineer," "judgment of the engineer" or their equivalents shall not appear in any specification or contract as calling for their exercise after the opening specifications showing exactly how they will be exercised in case any of the various contingencies with reference to which they are used shall occur.

(F) No requirement shall appear in the specifications that has a tendency to discourage bidding unless such requirement is manifestly essential to the work or to the public interest.

(G) There shall be no requirement in the specifications or in the management of the bidding that shall require any citizen to disclose the fact that he contemplates bidding or is interested in a coming bidding.

(H) Specifications must be so arranged that in comparing bids only one thing is to be taken into consideration, the total cost of the work.

(I) The specifications and drawings must all be ready for distribution and freely distributed as soon as the advertisement appears. No charge in excess of actual cost shall be demanded for any specifications or drawings accompanying them. They must be sold or furnished free to any one who asks for them without requiring any information from the party asking for them, and they must be returnable at cost after the opening.

(J) No specification shall require the contractor to follow the specifications and at the same time be responsible for accomplishing certain results, or to guarantee the endurance of the work, or to be responsible for the repairs for any time after the completion of the work according to the specifications.

(K) Specifications or instructions to bidders must suggest that every bid should be enclosed in two envelopes,

the inner sealed with wax and the outer not showing that a bid is enclosed.

(L) The official estimate shall be printed in the specifications with the information that no award shall be made for an amount greater than the total of the estimates and no supplemental contract increasing the work beyond that limit will be legal. Also that no bid will be accepted in which the price bid on any article is more than 10 per cent greater than the estimate, and that, if in the execution of the contract it be necessary to increase the amount of any item more than 10 per cent beyond the estimate, the price of such increase shall be determined by arbitration subject to court action, as specified in Sub. Par. (A) above.

5. Every citizen and every corporation doing business in the State shall have the full right to bid on any public contract and have the bid accepted if it is the lowest.

6. Bids shall be opened in public. All bids received must be kept and opened. Bids with erasures or changes in figures that affect the cost of the work must be thrown out. The public shall have the right to inspect the bids at the opening.

7. Whenever bids are advertised for they must be opened at the time mentioned, and an award must be made to the lowest bidder. Otherwise, the lowest bidder shall have a legal claim for damages equal to the profits had the contract been executed.

8. Any citizen of the State and any corporation doing business in the State shall have the right of injunction in the proper court to require compliance with this law, and such citizen or corporation shall have the further right to appear as a party in interest in any suit or adjudication between the contractor and the city official whenever the matter of any public contract comes before the court.

9. In the execution of all contracts, inspectors duly appointed according to law by the public official, shall have full power to see that the specifications are literally carried out and the completion of the work or the delivery of the goods shall be followed by the proper certificate of the inspector that the work and materials have been in accordance with the specifications. This shall relieve the contractor of all further responsibility.

For lack of time, the above suggested law has not yet been theoretically tested in connection with all known devious ways of crooked contractor and crooked official, but it is believed few loop holes have been left.

It should be given such tests by all members of our Society as well as a similar test for any hampering effects it may have on honest engineers and contractors.

From it we should evolve a law that will answer all requirements, and then the united effort of our Society should be urged to place it upon the statute books to help drive out the curse of dishonest public contracts.

Their name must be legion. The appalling sums I have given for the few I have examined must correspond to numerous others that are eating up the taxpayers' wealth and giving a cancer to public morals.

SOME WATER PURIFICATION COSTS AND THE VALUE OF PURE WATER.

According to the United States Census Bureau for the year 1907, the investment in public water supplies in cities of over 30,000 population amounted to $638,000,000, or $32.60 per capita. The approximate value of these properties was estimated at $619,000,000, or $31.60 per capita. The annual operating expenses of these 105 cities, with 19,600,000 population, supplying 142 gals. per capita daily, amounted to $29,000,000, including taxes at 1 1-3 per cent on the present value. If 5 per cent is allowed on the present worth as the value to the people of the money invested, and 2 per cent to cover depreciation, the cost of this water will average $71.50 per 1,000,000 gals., or $3.68 per capital per year. Improvements on the premises of the consumer probably bring the cost of the water up to $100 per 1,000,000 gals., or $5 per capita. Some further costs were given for the purification of water, and an estimate was made of the value of pure water by C. B. Burdick before the Indiana Sanitary and Water Supply Association, presented herewith. These figures are of value for purposes of preliminary estimates and in urging the adoption of filtration, says "Engineering and Contracting."

As cities develop, the needs of a soft water in the household and the factory are better appreciated, and while water softening has been practiced in the industries for a considerable time, it is only recently that municipalities have turned their attention in this direction, and only a very few municipal plants have been built. The financial benefit of a soft water in the household is not difficult to estimate. Experiments and figures by Whipple on the basis of 1 gal. per capita used for purposes requiring soap, with soap at 5 cents a pound, indicate a value of $10 per 1,000,000 gals. for each 100 parts per 1,000,000 reduction in hardness. There are other houshold economies brought about by soft water, such as the maintenance of plumbing and heating systems, the saving in the wear of clothing in washing, and in manufacturing cities very considerable economies in steam plants and the mechanical arts in which water is used. There seems to be no doubt but that the large majority of the water supplied in the Middle West could be softened with great profit.

As water softening is practiced today it is practicable so to construct the municipal filtration plant that the water may be softened without material addition to the plant investment. In such plants, therefore, the question of softening is an operating question, and in places where the waters are excessively hard at certain periods of the year only, it is practicable to incur the rather high operating costs only at such times as the softening appears to be of financial benefit.

At Columbus, O., for the year 1910, for example, the operating cost of the filtration and softening plant is stated as $19.42 per 1,000,000 gals., of which probably $12 to $15 represents the cost of softening. This plant reduced the incrustants from 111 to 35, an average reduction of 76 parts per 1,000,000, and the total hardness from 270 to 85, a reduction of 185 parts per 1,000,000. Where alkalinity or temporary hardness only is reduced the cost is much less. Thus, at New Orleans, for the year 1910, the alkalinity was reduced from 99 to 39 parts per 1,000,000, with a total operating cost for filtration and softening of $6.60 per 1,000,000 gals.

It is from the standpoint of health that pure water brings its largest financial return.

The most important of the water-borne diseases are Asiatic cholera and typhoid fever. The former has been practically eradicated in the most enlightened communities. Great strides have been made in the reduction of the typhoid death rate, but this disease is still prevalent throughout all civilized communities, and very much remains to be done in America. M. O. Leighton estimates the average value per life taken by typhoid at $4,635. Five thousand dollars is very commonly considered to be the value of a life. There are from 10 to 20 cases of typhoid for each death. It is very difficult to estimate

the cost per case, but statistics available seem to indicate actual expenditures of about $2,200 for each death.

Mr. Allen Hazen has presented figures on five cities where purification works have been introduced that appear to indicate that for each typhoid victim saved, three additional lives have been saved from other causes. The pure water has evidently a very beneficial effect upon diseases diarrhoeal in nature, and probably also engenders an increased vitality that assists in the resistance to other diseases not water-borne.

After considering all these figures, Whipple concludes that $10,000 per typhoid patient saved is a conservative estimate of the saving secured through the purification of a polluted supply. Upon this basis a saving of 10 per 100,000 living is equivalent to $1 per capita per annum (a convenient figure for estimating purposes), and he estimates the value of the purified water at $9.50 per capita per annum at Lawrence, Mass., $4.75 at Albany, N. Y., $3.80 at Binghamton, N. Y., and $4.75 at Watertown, N. Y.

The filtration works at Cincinnati, placed in operation in 1907, have apparently been effective in reducing the typhoid death rate per 100,000 from 80, 41 and 71, during the three years preceding the starting of the works, to 18, 13 and 6 for the three years following—an average reduction of 52, equivalent to $5.20 per capita. This, on the basis of the present population of 364,000, is equivalent to $1,900,000 per annum, which is 6 per cent on $31,000,000. The filter plant and reservoirs cost about $1,750,000.

At Columbus, O., the saving based on two years following, compared with three years preceding the beginning of filtration operations, has been about 34 typhoid deaths per 100,000, worth to the citizens of Columbus $3.40 per capita, or $616,000 per annum. This is 6 per cent upon $10,600,000. The filtration works are reported to have cost about $500,000. Other statistics are available that show savings of from $3 to $7 per capita per annum, through the benefit of pure water upon health.

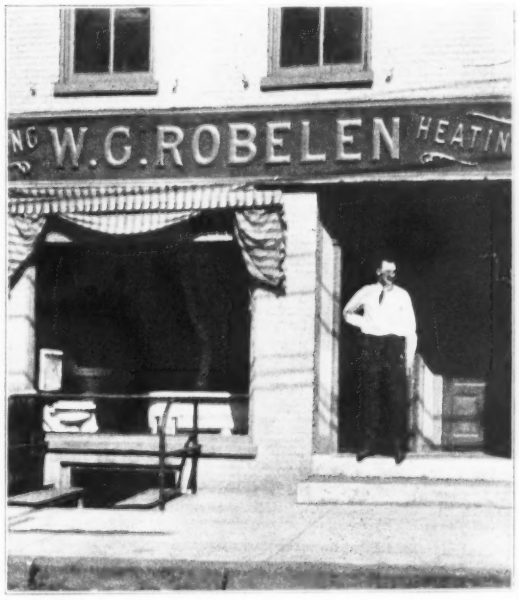
The cost of filtration has been very generally estimated at $10 per 1,000,000 gals. of water filtered, including operation and fixed charges. In mechanical filtration the operation costs run from $3.50 to $7 per 1,000,000 gals., with fixed charges, including basins, of about the same range. The writer has the figures upon about a dozen modern plants, large and small, that run from $15,000 to $25,000 per 1,000,000 gals. of filter capacity, including basins. The average is about $17,500. Allowing 7 per cent for fixed charges, the above figures of cost and operating cost produce annual charges of from $7 to $14, with $10 as an average. This figure corresponds fairly well with estimates upon slow sand filtration plants, in which the principle item of cost lies in the fixed charges. They also handle waters materially different from the turbid waters handled by many of the Western mechanical filtration plants.

At $10 per 1,000,000 gals. and a consumption of 100 gals. per capita, the total cost of filtration is 36½ cts. per capita per year, and at 150 gals. per capita, which is nearer the average consumption in cities using river water, 55 cts. per capita per year.

Assuming the cost at 55 cts. and the value of a life at $10,000, including incidental losses, a saving of 5½ lives per 100,000 will balance the cost of filtration. A reduction in the death rate of 11 will show a return double the net cost, and in all of the cities whose death rates have been cited above the indicated net return amounts to from 6 to 20 times the yearly cost of purification, including fixed charges. Viewed as a business proposition it can be stated conservatively that where a polluted water is filtered effectively, the net return in lives saved, after deducting operation costs and depreciation, will amount to from 50 to 200 per cent per annum upon the investment in filtration works.

AN ATTRACTIVE PLUMBING AND HEATING ESTABLISHMENT.

The accompanying illustration shows a corner of the display room of one of Wilmington's most prosperous and progressive master plumbers, W. C. Robelen. The



W. C. Robelen's Plumbing and Heating Establishment at Wilmington, Del.

picture indicates that this establishment represents the plumbing business as a real business through the application of modern business methods.

PITTSBURGH MASTER PLUMBERS' PICNIC.

The Pittsburgh Master Plumbers' Association will hold its annual picnic at Olympic Park, on Saturday, August 3, 1912. This park is a beautiful place situated 17 miles from Pittsburgh at Versailles Station on the main line of the B. & O. R. R. Excellent train service is available as the trains leave Pittsburgh B. & O. Depot at 8:30 a. m., 10:30 a. m., 12:10 p. m. and 2:20 p. m. Returning, trains leave Versailles Station at 4:30 p. m., 5:25 p. m., 6:30 p. m., 8:19 p. m, and 10:15 p. m. The day's program includes dancing, baseball, races, boating, etc, conducted by the Pittsburgh plumbers, and there is a summer theater and many other amusements conducted by the park authorities. The general committee in charge of the event consists of George M. Miller, chairman; P. J. Montague, Geo. F. Schade, jr., Frank Lannigan and E. M. Tate. Chairmen of the sub-committees are: Dancing, T. R. Marshall; Baseball, E. M. Tate; Refreshments, P. J. Montague; Races, J. C. Leubin. The picnickers are invited to take their own baskets along, but for those not wishing to do so, there will be plenty to eat at the dining room in the Park.

Facts About Sewer Gas

The Facts and Conclusions Drawn in This Article Were Read Before the Seventh Annual Convention of the American Society of Inspectors of Plumbing and Sanitary Engineers, Recently Held in St. Louis, Mo.

By Thos. J. Claffy

Sewer gas as an element with which we must reckon appeals to many of us as a comparatively recent acquisition. That there is a difference of opinion about its existence and qualifications is admitted. In a recent issue of "Domestic Engineering," we find this quotation from Justinian's Digest, A. D. 555: "The Praetor took care that all sewers should be cleaned and repaired, for the health of the citizens, because uncleaned or unrepaired sewers threaten a pestilential atmosphere, and are dangerous," which is an evidence of the respect due in consideration of its recognition by the ancients as an element of danger to public health. Sanitary and medical science have waged warfare against it continuously. Success and control seem to breed contempt for it as a health menace and so we are here today to add the relation of our knowledge and experience to the vast fund of matter pertaining to it.

In the report of the Sanitary Committee for 1907, 1908 and 1909, of the National Association of Master Plumbers, much has been written by the Massachusetts Institute of Technology on Sewer Gas. One of the opening paragraphs reads thus: "The dread of sewer gas which was almost universal among sanitarians of another generation is notably diminishing." Farther on we find this statement: "If the danger from sewer gas is unimportant, the plumbing regulations now in force should be appreciably modified in the interest of simplicity and economy, particularly in relation to existing requirements for the ventilation of traps. If, on the other hand, leaky plumbing does constitute a serious menace to health, the growing skepticism in regard to it should be checked before it leads to harm." And again noting the harmful effects of sewer gas, we find: "The death of a plumber who was working over a closet connected with a cess-pool, at Glanchau in Saxony in 1895, and the loss of the lives of five sewermen at East Ham near London in the same year, offer notable examples of this kind. These accidents were probably due to deficiency of oxygen and to the presence of such gases as carbon monoxid and hydrogen sulfrid, which are known to be formed by the decomposition of organic matter and whose acutely poisonous nature is well established. Small doses of these gases, especially if continued over long intervals of time, may produce less obvious but yet important derangements of the vital functions. Languor, headache, nervousness, loss of appetite, diarrhoea, and even vomiting have been caused at times by the odor of putrid gases and have been attributed in a vast number of other instances to sewer gas. Just how common this sort of poisoning may be is not easy to determine. There is abundant evidence that the air as it exists in its fullest concentration inside ordinary well-constructed sewers and house drainage systems produces no directly poisonous effect upon many who are exposed to it either temporarily or continuously."

"Dr. Alessi exposed rats, guinea-pigs and rabbits to the action of the putrid gases from an untrapped water-closet and from a box of excrement, and then inoculated these animals and others which had been kept under normal conditions, with typhoid and colon bacilli." The results indicated a high mortality among the animals exposed to putrid gases, while those not so treated almost all survived.

The popular fear of sewer gas is based principally on its possible relation to epidemics and infectious diseases. Many experiments have been made by noted sanitarians of England and France, as well as by American engineering chemists. In many instances the air in the public sewers has been found to be, as far as laboratory tests show, purer than the air on the street. Levy and Miquel in Paris, Petri in Berlin, and Laws and Andrewes in London, all found that in many of the experiments conducted by them, that the air in the streets contained more bacteria per measure than the air in the sewers. Practically all of these tests were made, however, in sewers where the air velocity was very low; they were made subject to the wet and dry conditions and the results were practically the same. Major Horrocks of England made tests which showed that there might be considerable danger of infection by sewer air borne bacteria.

The results of these tests were clearly set forth by F. H. Coults, M. D. B. So., D. H. P., F. C. S., before a sessional meeting of the Royal Sanitary Institute at Blackpool, England.

"Domestic Engineering," 1911: "In his first group of experiments, sewage inoculated with a rich growth of B. prodigiosus was placed in the bottom of a deep glass-jar; four inches above the surface of the sewage. Petri plates of nutrose agar were placed, and the surface of the agar exposed to the air after the sewage had been agitated to form bubbles. No colonies of the B. prodigiosus were found on the Petri plates after incubation, and similar negative results were obtained with the typhoid bacillus. Therefore the conclusion to be drawn is that in the absence of air-currents, bacteria are not ejected to a height of four inches by the bursting of infected bubbles. But very different results were obtained when air-currents were present. Petri plates suspended in the ventilating-shaft of an intercepting trap 9 ft. above the surface of soapy water containing the B. prodigiosus were infected readily, thus showing that currents of air passing up the vertical pipe could carry bacteria separated by the bursting of bubbles. Similarly, he found that bubbles rising naturally through stagnant water in a catchpit may eject bacteria, which will be carried away by currents of air passing over the surface of the fluid. In his next experiments three 2 ft. lengths of 6 in. drain-pipe had a rich emulsion of B. prodigiosus poured into them and equally distributed over their inner surface. When the pipes were quite dry, they were arranged by clay-joints so as to form the vertical ventilating-pipe on a length of drain. Nutrose agar plates were then suspended in the vertical ventilating-pipe and sewage allowed to flow along the horizontal drain for 20 minutes at a rate not exceeding 3 ft. per second. On incubation the plates showed

colonies of B. prodigiosus. As the sewage passing through the horizontal pipes did not contain this bacillus, nor the outside air, it is reasonable to assume that the currents of air caused by the flowing of the sewage carried up dried particles of B. prodigiosus detached from the walls of the vertical pipes.

The next group of experiments was to determine whether specific bacteria were ejected into the air of sewers from sewage flowing under normal conditions.

The trap of a six-inch disconnecting trap was filled with sewage. Petri plates were suspended in the vertical ventilating-pipe 6 ft. 9 in. above the sewage. Sewage containing typhoid bacilli was then allowed to flow down the drain on the house side of the trap, and collected from the drain on the sewer side of the trap. The rate of flow was regulated to be not more than 3 ft. per second. Numerous typhoid germs were found on the plates. Similar experiments with B. prodigiosus were successful to heights of nearly 12 ft. above the trap.

The next series of experiments were arranged to test the value of a disconnecting trap in protecting a house-drainage system from microbes in sewer air. Pipes were arranged to represent a short house-drainage system, with an intercepting trap and vertical ventilating-pipe. Beyond that, on the sewer side of the trap, was another vertical pipe to represent a sewer ventilator. Plates of nutrose agar were suspended in both vertical pipes. Sewage containing B. prodigiosus was then allowed to flow along the pipes representing the sewer, at a rate not more than 3 ft. per second. Colonies of the germ were found in the vertical pipe representing the sewer ventilator, but none in that representing the ventilator on the house side of the trap. Even when the fluid in the trap was disturbed by a 3 gal. flush every five minutes no collection of B. prodigiosus were found on the plates on the house side of the trap, showing that the trap effectually protected the house-drains from contamination from the sewer side. Removing the trap, but otherwise leaving the experimental system precisely as before on pouring infected sewage down the sewer-pipes and flushing the house-drains by a three gallon flush every five minutes the B. prodigiosus appeared in the ventilating-pipe of the house-drains as well as in that of the sewer. These results show that a disconnecting trap prevents germs present in the sewer passing into the house drainage system.

The next series of experiments are of very great value, especially as they were made with actual and not experimental drainage systems. In a newly laid house-drainage system, plates were suspended in the disconnecting chamber, and a plate was fixed in front of the air inlet of the system (the low ventilator) which was furnished with a mica-flap valve. An emulsion of B. prodigiosus was placed in the pan of the house water-closet, which was then flushed out. When the plates were incubated colonies of the special germ were found on every plate. This result is significant of the inefficiency of the ordinary mica-flap valve. At a Military Hospital plates suspended in the top of a 6-in. ventilating pipe 50 feet above the ground level were infected when an emulsion of the B. prodigiosus was placed in the pan of a water-closet in the basement, which was then flushed out.

Another experiment was instructive, in which plates placed in an intercepting chamber (C) at one corner of a Military Hospital block became infected by bacteria flushed out of a water-closet pan at another corner of the block, although the sewage had to pass first through one intercepting chamber (B) and along a considerable length of sewer. The cause of this result was found in the stopper of the rodding arm of chamber (C) being missing; when it was replaced, plates in chamber (C) did not become infected. The only other experiment I need mention is one which proved that the typhoid germ itself could be carried from the surface of liquid in a trap up the ventilating-pipe when stools from an enteric fever patient were allowed to flow through the trap. This shows that bacteria in their normal condition in infected sewage can be carried into the air just as the naked bacilli in the preliminary tests.

The results obtained by Major Horrocks will no doubt be tested by other experimenters, but I think no one who closely studies the records of his experiments will fail to agree that they deserve serious consideration. Personally I feel satisfied that further experience will only serve to confirm these conclusions. Their bearing on the question under discussion is sufficiently obvious. The experiments conducted by Major Horrocks are important in the accuracy of their details and in the proof contained therein of the releasing of the bacteria from sewage by splashing or bubbling. All through the report of the Sanitary Committee of the National Association of Master Plumbers for 1907, 1908 and 1909, we find corroboration of this phenomena in the results of the experiments conducted in this country and in Europe. It is a well known fact that stagnant sewage bubbles by reason of the explosive effect of the gases formed within the bed of sewage or near its bottom. This happens whether the sewer be open or of the cylindrical type. Experiments show that bacteria are splashed out under what are termed unusual conditions. If bacteria be splashed out or released from sewage by reason of the bubbling or splashing effect surely then they are released every time that the water-closet is discharged or other fixtures through which they be discharged in the sewer and in that case the soil-pipe within the building would be an avenue of communication. If bacilli-colon may be carried by flies from open privies, and this seems to have been demonstrated clearly, may they not likewise be carried by air-currents from sewers to the outer atmosphere or to the atmosphere of the house?

In order to prevent direct communication by the free passage of air-currents from sewers, to living rooms, factories or work places, we have our present somewhat elaborate plumbing system.

Much has been written on bacteria in the works mentioned in this paper and very little about gas. It is a well known fact that there is gas within sewers at all times; under certain conditions it accumulates in dangerous amounts. Under ordinary conditions it is harmless but it is under the extraordinary conditions that life is lost, consequently safeguards are provided. Those who have had experience in plumbing or sanitary work in our larger cities are well aware of the prevalence of gas within sewers in the winter time due to leaking gas-mains. There is, it is true, during the milder weather a considerable amount of this same gas to be found in sewers and this constitutes the real live danger to health and to the safety of life and limb which is so commonly attributed to sewer gas.

Admitting that there is, or is not, danger of infection from bacteria in sewers—the fact remains that bacilli are to be found in sewage and sewer air. The fact also remains that gas exists in sewers, whether it be from gas-mains or decomposing animal and vegetable wastes, matters not, it exists, and we know by experience that the breathing of sewer air from an open soil-pipe or waste opening will soon cause headaches, nausea, etc.

We never yet heard a case of nausea or headache being produced by breathing the ordinary clean, pure air. We are informed that sewer air is purer than the air of the street, yet we do not find anyone voluntarily living in a sewer.

We do not know that the enervating influences of city life are very soon dissipated by a short sojourn in the country where the life-giving qualities of the natural oxygen in the air soon restores the system to its proper vigor. Innumerable instances may be cited in support of the statement that gas from sewers or sewer air causes illness and innumerable instances may be cited to prove that the water seal in traps in plumbing system designed to keep such air and gas out of houses and buildings has been lost by evaporation, syphonage or air compression.

If all these things be true then it would appear to be highly necessary that the most careful watch be kept of the progress of the science of plumbing in order that the safeguards which have been provided may not be nullified by too hasty action in adopting the views of men who have conducted experiments with a single object in view. We have evidence, and plenty of it, that chemists and bacteriologists have recorded themselves on opposite sides of this question.

We have our own experiences to prove to us that there is at all times an element of danger in sewer gas and sewer air. We consider it proof positive that traps with their water seals are necessary in plumbing practice and that the protection of these water seals by proper ventilation of the plumbing system is as necessary as the water seals of the trap.

JOHN AND THE CHANDELIER.

By H. P. Sorensen.

"Oh, dear!" said Mrs. Merrilegs, "I had such an accident to-day!"

"You didn't drop my meerschaum pipe again, did you?" demanded Mr. Merrilegs, with an intensely irascible look upon his lively features.

"No. I didn't drop your meerschaum pipe again!" cried Mrs. Merrilegs with proper spirit. "I merely knocked the top of my head off!"

But as for the master of the house (whether or not it was because of the safety of his meerschaum pipe, I do not know) he smiled with satisfaction and would probably have hummed a stave from an old melody if he had known any staves from old melodies.

"Where did you knock it?" he pleasantly asked.

"I knocked it against the chandelier," she said, with rising indignation, "and if you want to know how hard I knocked it you just feel that chandelier. I loosened it so that it nearly came out of the ceiling."

Thus appealed to on his mechanical side, Mr. Merrilegs promptly examined the chandelier and started it swaying like a swing.

"Ha!" he said, more satisfied than ever, "I'll fix that after dinner."

"Now, John you mustn't touch it," she pleaded, her heart sinking. "A chandelier isn't a thing to be fooled with."

"There you go again!" cried Mr. Merrilegs, glaring at her. "Anybody would think (to hear you talk) that I was the greatest natural born fool that ever lived. It's a funny thing to me that I can get respect everywhere but in my own house," he bitterly continued. "As if I couldn't fix a little thing like that!"

And Mr. Merrilegs atacked his dinner with the rancor of a man who hated it, cutting his meat (indeed) as though it were a mortal foe.

"John," she pleaded, "do get a plumber!"

"A plumber!" he scoffed. "Yes! That's the way people keep poor and die poor and never have a cent as long as they live. What? Get a plumber for a simple thing like this? I'd like to see myself!"

He ate his pie with the celerity of a steam shovel trying to make a record in the Culebra Cut, and after Mrs. Merrilegs had cleared off the table he addressed himself to the chandelier with such a knowing look that his wife's heart sank even into her shoes, and she began to move the furniture out of the room.

"What are you doing that for?" he irritably demanded.

"So it won't get broken when you fall on it," she said.

For reply Mr. Merrilegs gave his wife a terrible look and, charging out of the room, he came charging back with the step ladder. He placed this under the chandelier and gingerly mounted to the top step, for the step ladder was shaky and our hero made out in circumference for what he lacked in height.

"Now, then," he said, looking down at the battlefield, like a general on a mountain top, "bring me the monkey wrench!"

She fetched him the monkey wrench.

She went out of the room, and when she returned she was wearing her hat and coat and was carrying the candlestick in her hand.

"Where are you going?" he demanded again.

"John," she said, "I can't stand it. I'm too nervous. I've got mother's picture and the fire insurance policy and I'm going to call on Mrs. Spicer. If anything happens I shall be able to hear the fire engines from there." She placed a bottle on the sideboard. "There's the liniment," she said. "Goodby."

It was nearly an hour later when she returned. She opened the door and silence greeted her. She smelled for smoke, but there was none. She listened for groans, but there were no groans. A fitful light burned in the dining room, and when she walked fearfully through the doorway she saw that the chandelier had broken off and had fallen to the floor, one of the legs of the stepladder had split off, the candle was guttering away between John's feet and Mr. Merrilegs was standing on the top step of the ladder, one of his hands clasped around the stump of the gas-pipe that still remained in the ceiling and the thumb of his other hand being used like a cork to hold back the lethal and explosive gas from the eager flame below.

One glance at John's haggard face, and Mrs. Merrilegs ran and turned off the gas at the meter. Running back to the dining room, she held up the step-ladder while the marooned man stiffly descended to the floor.

"The chandelier dropped when I was wiggling it," he hoarsely explained, "and broke the leg of the step-ladder. I had to hang on to the piece of pipe that was left to keep from falling, and I had to hold my thumb in the pipe to keep the gas away from the candle. Oh, my back! Oh!"

"Shall I go get you something, John?" asked Mrs. Merrilegs.

"Yes!" cried John, more hoarsely than before, " go get me a plumber!"

Pittsburgh, Pa.—The partnership heretofore existing between John Fitzpatrick and W. Ed. Morrison, under the name of the Iron City Plumbing Co., has been dissolved, Mr. Morrison retiring. The firm will be continued under the direction of Mr. Fitzpatrick.

FOURTH ANNUAL MEETING AND OUTING OF THE MAINE MASTER PLUMBERS' ASSOCIATION.

Master plumbers and their friends to the number of more than one hundred and fifty participated in the fourth annual meeting and outing of the Master Plumbers' Association of the State of Maine, which was held at Long Island, Portland Harbor, on Monday, July 8th. The day was an ideal one and although Old Sol scorched the city good the plumbers and their guests felt the heat but little.

The party left Portland by special steamer early in the forenoon and the cool sea breezes and pleasant music made an auspicious start for what was one of the most successful outings the organization has ever held.

Hardly had the gangplank been lowered at the island than the base ball enthusiasts made their way to the ball field and a contest was started between the Master Plumbers and Salesmen. Although the game was only five innings it was a notable contest and the scorers announced, not without being disputed, that the salesmen had won 13 to 9. M. J. Hirschfield of Boston, and Ellsworth F. Hayden, of Portland, undertook the task of keeping score while Frank Williams and W. S. Paul, of Portland, risked their lives as umpires.

After the ball game came the dinner—a real island fish dinner—and everybody was on hand with an appetite. Robert Robertson, of Beverly, Mass., vice president of the Massachusetts State Association, was the guest of the day and at the business session which followed the dinner he made a short address on "Organization," being introduced by President E. W. Goss, of Lewiston.

The members voted to leave the affairs of the organization in the hands of the present officers until fall when a new set of officers will be elected. The present board is composed of: President, E. W. Goss, of Lewiston; vice-president, B. P. Carter, of Bar Harbor; secretary, J. E. Donovan, of Winthrop; treasurer, D. A. Calhoun, of Portland; executive committee: G. A. Norwood, Saco; Patrick Mahoney, Portland; Fred Arnold, Waterville; J. H. Chase, Lewiston, and Richard Downing, of Bangor.

After the business session there were a series of sporting events for men, women and children, which were won as follows:

Ladies' ball rolling contest for prize of a handsome copper jardiniere; won by Miss Florence M. Hall, of Auburn.

Tug of War, prizes, cups and saucers; won by Master Plumbers, headed by Captain Mahoney, over the Salesmen headed by Captain Rosebrooke.

One hundred yard dash, prize, necktie; won by Eugene Adcock.

Three legged race, prizes, neckties; won by W. B. Mahoney and F. A. Taylor.

Girls' race, prizes, fancy china; won by Miss Catherine Myers, Mary O'Brien second.

Boys' race; won by Leo Mahoney, Everett Bickford second, Augustus Keith third.

The return to Portland was made by the same special steamer in the gathering dusk and all the way the members sang the praises of P. A. Mahoney, F. A. Davis and W. J. Miller, the Portland men who were in charge of the arrangements for the outing.

The members of the association and their guests, with the exception of the ladies, included:

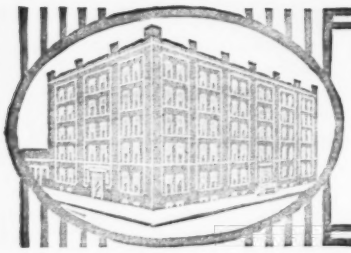
W. F. Snow, Pine Point; A. M. Spear, Albany, N. Y.; W. M. Collins, Binghamton, N. Y.; B. E. Near, Cottage Farm; C. E. Morrill, Auburn; M. C. Tarr, Lewiston; J. H. Chase, Auburn; C. S. Stimson, Auburn; W. P. Bowdoin, Wiscasset; E. B. Crockett, New York; L. C. Hatch, Livermore Falls; George W. Paul, W. S. Paul and T. F. Kimball, Melrose, Mass.; S. R. Mitchell, Boston; J. P. Eldridge, Ellsworth; J. E. Donovan, Winthrop; R. A. Nordbloom, Boston; Arthur D. Brackett, Boston; C. N. Fairbairn, Boston; J. H. Guilmet, Lewiston; T. W. Kerrigan, Lewiston; Frank Williams, Malden, Mass.; E. W. Goss, Lewiston; G. B. Ridley, Brunswick; E. L. Hill, Sebago Lake; George A. Caldwell, Boston; J. J. Dervan, Boston; Frank D. Healey, Rockland; Robert Roberston, Beverly, Mass.; M. J. Hirschfield, Boston; C. F. Dolliver, Lewiston; A. O. Burrill, Oakland; John Fardy, Waterville; John B. Smith, Lewiston; L. M. Longley, Norway; Fred D. Sibley, Sanbornville, N. H.; H. A. Young, Auburn; F. A. Taylor, Boston; John Kerrigan, Dallas, Tex.; Charles Curtis, Cambridge, Mass.; C. W. Lanagan, Boston; G. A. Smith, Boston; Peter Mackey, Skowhegan; Eugene Adcock, Boston; J. E. Herrick, Beverly, Mass.; G. A. Norwood, Saco; A. F. Sawyer, Boston; E. C. Rawson, Mechanics Falls; Wilfred McLeary, Farmington; William H. Taylor, Boston; and the following from Portland: Ellsworth F. Hayden, F. E. Wheeler, Blaine J. Harmon, Fred H. Rounds, J. H. Duffy, C. R. Nelson, A. M. Rosebrook, J. H. Douglass, C. A. Carr, George M. Blake, J. Warren Chase, F. H. Stuart, C. A. Maynard, F. A. Maynard, D. A. Calhoun, R. T. Burns, F. A. Davis, W. B. Mahoney, James Boyman, C. O. Morton, E. E. Adams, Algernon Knight, W. J. Miller, C. Madsen, John Feeney, Leo. Mahoney, Edwin T. Myers, Paul Myers, M. C. Hutchinson, S. D. Lincoln, Capt. R. C. Parker, R. A. Godfrey, M. H. Myers, and Patrick A. Mahoney.

AT THE CALIFORNIA MASTER PLUMBERS' OUTING.

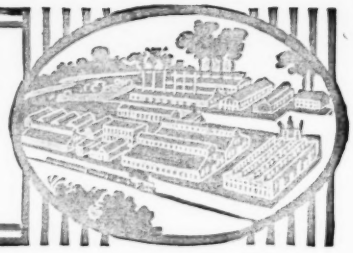
John B. Mutch, of Long Beach, Cal., was one of the prominent master plumbers of the Golden state who attended the recent annual outing of the state association at Lake Tahoe. Mr. Mutch reports that the occasion was

John B. Mutch and Mrs. Mutch at Lake Tahoe, Cal.

a very enjoyable one and that he had an exceptionally good time trout fishing. The accompanying illustration shows Mr. Mutch holding the trout which he caught, which weighed five and a half pounds and was twenty-four inches in length. In the other picture is shown Mrs. Mutch feeding a chipmunk in her lap while attending the annual outing of the state association.



News of Interest Among the Wholesalers and Manufacturers



WILL MANUFACTURE BATHROOM SPECIALTIES.

The Adjustable Head-Rest Co., of New York City, has been incorporated with a capital of $10,000, to manufacture bathroom specialties. The incorporators are G. Gannon, C. Fitzpatrick and E. Fitzpatrick.

INSTALLING NEW MACHINERY AND FURNACES.

The Allyne Brass Foundry Co., of Detroit, Mich., is making extensive additions to its present equipment in the way of new machinery, furnaces, etc. When the new equipment is installed and ready for operation, the company will be able to double its present output.

REMODELING AND ENLARGING ITS FACTORY AND OFFICES.

The W. H. Anderson Tool & Supply Co., 14-16 Macomb Street, Detroit, Mich., has been doing considerable enlarging and remodeling in its factory, store-rooms and offices. The new arrangement of the plant and the extra floor space secured give the company twice the amount of floor space it formerly occupied.

WILL MANUFACTURE PLUMBING SPECIALTIES.

The Riverview Manufacturing Co., of Boston, Mass., has been incorporated with a capital of $25,000, to manufacture plumbing specialties. The incorporators are Edwin F. O'Connell, Charles J. Brown and Edward J. Seavery.

WILL MAKE PLUMBING SPECIALTIES.

The Cully Sanitary Co., of Pittsburgh, Pa., has been incorporated with a capital of $10,000, to manufacture plumbing specialties. The incorporators are J. S. Cully, of Burgettstown, Pa.; E. A. Cully, of Parkersburg, W. Va., and A. D. Cully, of 213 North Elizabeth Street, Pittsburgh, Pa.

RECEIVER APPOINTED FOR THE DUQUESNE SANITARY CO.

Upon petition of George H. Albertson, president of the Duquesne Sanitary Co., 426-428 Second Avenue, Pittsburgh, Pa., jobbers of plumbing supplies, Judge McFarland of the Court of Common Pleas of Allegheny county appointed Willand F. Albertson receiver for that company, on July 1st. The receiver in an interview states that the action was more in the nature of a measure of protection of the company's assets, as it is understood that the assets are more than ample to cover the liabilities. Poor collections are ascribed as the reason for the receivership, which it is thought will be of short duration. The company does a large business and is a well-established jobbing house in Pittsburgh, having large accounts outstanding which it has been unable to realize on promptly. The officers of the company are: George H. Albertson, president; John E. Fitzgerald, secretary and manager.

W. J. PRICE, OF FARGO, N. D., GOES TO CONSOLIDATED ENGINEERING CO., CHICAGO.

Wm. J. Price, founder of the Fargo Plumbing & Heating Co., for 20 years engaged in the heating contracting business as president of that company, has disposed of his interest and secured the entire holdings of Thomas J. Leonard in the Consolidated Engineering Co., of Chicago, manufacturers of the Van Auken system of vacuum heating.

B. E. Van Auken succeeds Mr. Leonard as president and Mr. Price assumes Mr. Van Auken's duties as vice-president and secretary, and E. B. Gordon, Jr., retains his position of treasurer.

Mr. Price moved to Fargo, N. D., from Pittsburg in 1892 and established the business which he has just disposed of and which, under his personal supervision, became one of the biggest factors in the heating business of the Dakotas and the northwest. The limitations imposed by a comparatively new territory and the size of the city, caused him to cast about for a broader field of activity, and in the Consolidated Engineering Co., of Chicago, he found a sphere sufficiently big to cause his disposal of the Fargo holdings and his consequent move to Chicago.

Mr. Price brings with him an untiring energy, a splendid personality and a fund of experience in the selling and contracting end of the heating business.

He was a member of the State Legislature for four years, during which time he introduced and had passed laws regulating the heating and ventilating of the public school houses of North Dakota, this being the seventh state to enact such laws.

He was one of the organizers and the president of the State Association of Master Plumbers and Steamfitters of North Dakota.

Mr. Price is a firm believer in the Van Auken system and specialties and installed them extensively in the work for which he contracted during the past 10 years.

His addition to the executive staff of the Consolidated Engineering Co. will mean much to that organization and further advance the great industry founded about the Van Auken system of vacuum heating and Van Auken specialties, while the connection will mean much to Mr. Price, inasmuch as it broadens his sphere and offers greater opportunities for extending his unusual ability.

It is a happy combination of two big factors in the heating business.

BUSINESS EXTENSION OF THE CONTINENTAL RADIATOR & FOUNDRY CO.

The Continental Radiator & Foundry Co., of St. Louis, Mo., is a concern whose progress is marked by the recent expansion of the business. This expansion includes a recent merger with the Continental Foundry Corporation, of Fort Madison, Iowa. The merged company is incorporated under the laws of the state of Missouri with an authorized capitalization of $400,000, $200,000 of which has been paid in, and an additional $50,000 subscribed for. An extension of the plant at Fort Madison will be completed and in full operation on Sept. 1st of this year. This entire plant will be operated by electric power secured from the new $25,000,000 Mississippi River dam at Keokuk, Ia. Every modern manufacturing facility is included in the holdings of the new and expanded Continental Radiator & Foundry Co.

PNEUMATIC STORAGE TANKS.

The National Steel Tank & Mfg. Co., of Bradford, Ill., issued to the trade a new price list booklet covering standard and extra heavy storage tanks, also their line of National pneumatic tanks, in both black and galvanized construction. This booklet, the cover of which is reproduced in this column, is a valuable piece of literature, and discount sheets in connection with the price list will be mailed to the trade upon application.

Front Cover Design of the National Steel Tank & Mfg. Co's. New Catalogue.

JULY "RADIATION."

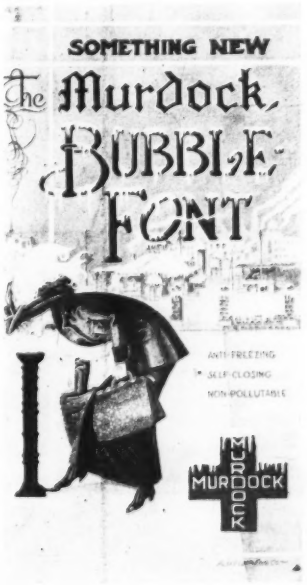
"Radiation," the monthly publication of the United States Radiator Corporation, of Detroit, Mich., contains ten different articles on heating which are of exceptional interest to the trades. The July number of "Radiation" is handsomely printed and illustrated and should be in the hands of every plumbing and steam-fitting contractor. Copy of the issue can be obtained by any plumber or steam-fitter upon making request to the advertising department of the United States Radiator Corporation.

AMERICAN DISTRICT STEAM CO. ORGANIZES GENERAL ENGINEERING DEPARTMENT.

The American District Steam Co., of North Tonawanda, N. Y., has just announced the organization of a general engineering department under the management of Byron T. Gifford, with offices on the ninth floor of the First National Bank Bldg., Chicago, to which location the company has removed its Chicago offices from the Monadnock Block. Mr. Gifford was formerly connected with the Central Station Engineering Co., of Chicago, and he is well qualified for his new position. The American District Steam Co. has also secured the services of James A. Bendure, Charles A. Gillham and Arthur E. Duram. Mr. Bendure and Mr. Gillham will be associated with the contracting department of the Chicago offices, and Mr. Duram will be associated with the engineering staff of the Chicago office. Mr. Bendure was formerly connected with the Economy Light, Fuel & Power Co., of Lockport, N. Y., and Mr. Gillham and Mr. Duram were formerly connected with the Central Station Engineering Co., of Chicago.

SOMETHING NEW.

"Something New" is the title of a booklet issued by the Murdock Mfg. & Supply Co., of Cincinnati, O. The cover of this unique booklet is reproduced in this column.



Front Cover Design of the Murdock Mfg. & Supply Co's. New "Bubble Font" Catalogue.

The booklet describes in an interesting manner the meritorious features of the Murdock Bubble-Font. It also contains interesting information on the use and installation of this drinking device and its desirability for filling a sanitary necessity in connection with schools, factories, city streets and public parks. The booklet is handsomely and uniquely printed and illustrated.

In the Left Hand Picture Are Three Members of the Committee on Arrangements of the Union Sanitary Mfg. Co.—The Center Picture Shows Action of an Exciting Event, the Sack Race—In the Right Hand Picture Is the Winner of the Hobble Race.

ANNUAL OUTING AND PICNIC OF UNION SANITARY MFG. CO. OF NOBLESVILLE, IND.

This Event Held on July 4th, Participated in by Employees and Friends of the Company, Was a Big Success.

In Brown's Grove, a picturesque natural park, near Noblesville, Ind., was held the annual outing and picnic of the Union Sanitary Mfg. Co., on July 4th. The outing and picnic was participated in by the employees of the company and their families and friends. The day was an ideal one and the occasion resulted in a most enjoyable and successful event. The arrangements and entertainment committees composed of officers, members of the firm and department heads, provided a most excellent program of entertainment events.

Dr. E. C. Lochr, mayor of Noblesville, and Dr. H. H. Thompson, of that city, assisted Messrs. Brigham, Snyder, Kline, Evans and Clark, of the Union Sanitary Mfg. Co., in making the event a success.

During the morning a base ball game between teams composed of the Union Sanitary Mfg. Co. molders and a team of helpers of the same company, was the main feature. These two teams struggled through seven innings of the national pastime and the helpers were victorious by a score of sixteen to two.

Picnic luncheons were served in the grove in various small groups of different families and their friends.

After luncheon had been concluded the following program of athletic events was provided. This list of events includes the winners and prizes awarded to each:

1.—Race for girls 6 years of age and under: 1st.—Ring, won by Gertrude France. 2nd.—Cash, 50c, won by Mary Casey.

2.—Race for boys 6 years of age and under: 1st.—Box of candy, Martin Casey. 2nd.—Cash, 50c, won by Dolphus Whitesell.

3.—Race for girls 9 years of age and under: 1st.—20 show tickets, won by Sarah Penwell. 2nd.—Box of candy, won by Alice Stipp.

4.—Race for boys 9 years of age and under: 1st.—20 show tickets, won by Robert Henning. 2nd.—Box of candy, won by Earl Umbenhour.

5.—Race for girls 12 years of age and under: 1st.—Camera, won by Nilma Loehr. 2nd.—Box of candy, won by Esther Hiatt. 3rd.—5 show tickets, won by Dorothy Brattain.

6.—Race for boys 12 years of age and under: 1st.—$1.00 in cash, won by Albert Hull. 2nd.—50c in cash, won by Raymond Powell. 3rd.—5 show tickets, won by Robert Leffert.

7.—Race for girls 16 years of age and under: 1st.—Box of stationery, won by Lena Kennedy. 2nd.—10 show tickets, won by Lois Parish.

8.—Race for boys 15 years of age and under. 1st.—Ball and bat, won by Albert Hull. 2nd.—10 show tickets, won by Robert Leffert. 3rd.—5 show tickets, won by Robert Ward.

9.—Jockey race for men: 1st. Team—One years' subscription for the Enterprise, won by Tom Lennen; one year's subscription for the Ledger, won by Fred Edwards. 2nd. Team—25 cigars, won by Oscar Riley and Everett Gatts.

10.—Race for single ladies over 16: 1st.—$5.00 hat, won by Miss Ruby. 2nd.—$2.50 bottle of perfume, won by Dolly Carmine. 3rd.—$1 fruit dish no entry.

Events 7, 8, 9 and 10 were for shop employees and their families only.

11.—Sack race for men—open to all contestants: 1st.—$5.00 pipe, won by Will Wall. 2nd.—$3.00 hat, won by Jack Seymour. 3rd.—Shirt and tie, won by Melvin Baker. 4th.—Hair cut, shave and shampoo, won by Eddy Bragg.

12.—Race for employees only, no age limit: 1st.—$10.00 valise, won by Lou Coughlin. 2nd.—Steel rod and reel, won

The "Hobble Race" Won by Mary Casey.

Judges Deciding an Event.

by Jack Seymour. 3rd.—Box of holeproof hose, won by A. E. Mayfield. 4th.—Hair cut, shave and shampoo, won by Oscar Riley.

13.—Hobble skirt race for girls over 16—open to all contestants: 1st.—$5.00 ring, won by Mary Casey. 2nd.—$2.00 purse, won by Lois Crawford. 3rd.—3 pair of hose, won by Mary Leffert. 4th.—Waffle iron, won by Dolly Carmine.

The Story of the Union Sanitary Mfg. Co's. Outing Is Best Told in These Pictures.—In the First Picture in This Column Dr. E. C. Loehr, Mayor of Noblesville, and Dr. H. H. Thompson and Their Friends Were Caught in a Restful Pose by the Camera Man.—Other Pictures Show Numerous Interesting Events of the Day.

14.—Retail merchants' race—Merchant may be represented by clerk: 1st.—Sanitary drinking fountain, won by Willard Hare.

15.—Race for employees over 40 years of age: 1st.—$5.00 pair of trousers, won by Dora Wiles. 2nd.—10 pounds of lard, won by Everett Gatts. 3rd.—$1.00 bread, won by J. Parker.

16.—Three Legged Race—ladies and gentlemen—open to all contestants: 1st.—Lady, chair, won by Frankie Crawford. Gentlemen, 50 cigars, won by Harley Forsythe. 2nd.—Lady, hammock, won by Dolly Carmine. Gentlemen, 25 cigars, won by Lew Coughlin.

17.—Married ladies' race. Must be married over 6 years. For wives of employees only: 1st.—Parasol, won by Dora Scott. 2nd.—$2.00 pair of shoes, won by Mrs. Oscar Riley. 3rd.—Lemonade set, won by Mrs. Harry Batdorf. 4th.—$1.00 bread checks, won by Mrs. Wm. France.

18.—Boot and shoe race—open to all contestants: 1st.—$5.00 coupon book for groceries, won by Dora Wiles. 2nd.—$3.00 pair of shoes, won by Melvin Baker. 3rd.—Alarm clock, won by Homer Wall.

19.—Master Plumbers' Egg and Spoon Race: 1st.—An A-77 lavatory or its equal, won by Fred Edwards.

E. V. Brigham, General Manager of the Union Sanitary Mfg. Co., and Guests at Luncheon.

20.—Ladies' Nail Driving Contest, open to all contestants: 1st.—50 pounds of sugar, won by Lois Crawford. 2nd.—Pair slippers, won by Mrs. Isaac Partlow. 3rd.—Fancy plate, won by Mrs. Wm. France. 4th.—2 cans of peaches, won by Mrs. Oscar Riley.

21.—Plumbers' Employees Race: 1st.—Gold mounted pipe, won by Luther Harrison. 2nd.—Work shirt and overalls, won by Tom Lennen.

22.—Fat Men's Race—200 pounds or over—for employees only: 1st.—50 pounds of flour, won by George M. Snyder. 2nd.—1 ham, won by Frank Whitesell. 3rd.—4 pounds of coffee, won by Lum Ferguson. 4th.—Hair cut, shave and shampoo, won by Geo. Evans.

23.—Pole vault for boys 15 years of age or under: 1st.—Base ball glove, won by Harry Leffert. 2nd.—2 pair hose supporters, won by Robert Leffert.

24.—Pole vault—open for all: 1st.—50 pounds of flour, won by Willard Hare. 2nd.—Briar pipe, won by Henry Cottingham. 3rd.—1 ham, won by Harry Leffert.

25.—Tug of war: 50 cigars, won by Harry Batdorf's team.

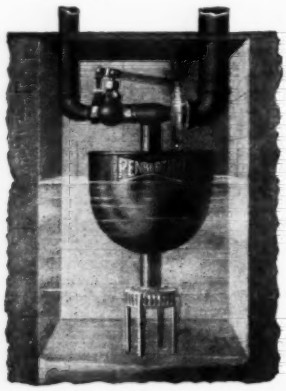
26.—Baby show for babies under 2 years of age—judges to be unknown: 1st.—$3.00 in merchandise, won by Harold Sapper. 2nd.—Ring, won by Paul Whitesell.

LEAD.

The surprise of the season was an advance of 30 points by the American Smelting & Refining Co., last week. The independent sellers quickly advanced their quotations, and the price of lead in New York now ranges from 4.70 to 4.80 cents. The demand for lead generally goes hand in hand with that for copper, and this excellent business is simply a reflection of the activity in the copper trade.

THE PENBERTHY AUTOMATIC CELLAR DRAINER.

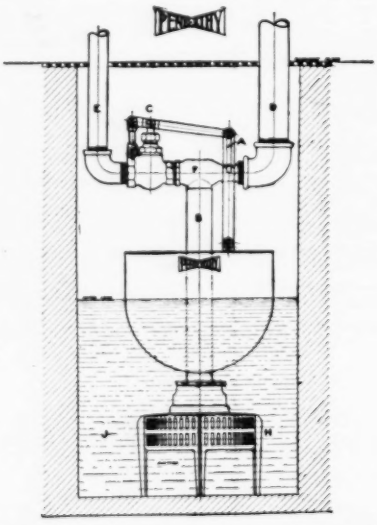
The Penberthy Automatic Cellar Drainer is a Penberthy water pressure ejector of high capacity, automatically operated by a float-controlled, quick-opening-and-closing valve C. This valve is never partially opened —it cannot leak, and allows the ejector to give its greatest efficiency by working to full capacity. The float arms



The Penberthy Automatic Cellar Drainer.

are slotted at A, where they cannot connect to the valve lever, C. This prevents the ejector from operating until the water has raised the float up to the highest point, and, as the water is ejected, they travel down the length of these slots before the weight of the float affects the valve. This allows the machine to work for longer periods and not so often, thus preventing considerable wear and the leakage and dribbling of water, as is common in the majority of drainers.

To enable the installation of this drainer in small holes, or sumps, it is made as compact as possible. The



Sectional View of the Penberthy Automatic Cellar Drainer.

float, instead of being round, is flat on the top; it has more buoyancy and occupies less space than a round float of the same diameter. The manufacturers have further economized on space by building the float around the suction pipe, B. This patented feature has the added advantage of being rigid and overcomes all the trouble of the common loose float. The balance of the drainer is built directly above the float; this not only keeps the whole machine in as small a working space as possible but also keeps all working parts with the exception of the strainer and float, above the water, thus preventing corrosion or the exterior parts becoming clogged up by deposits of slime, dirt, or sediment. The interior parts are prevented from coming in contact with foreign particles by the special strainer, H, which is so constructed that instead of the water being drawn directly upward, it is taken in at the sides, allowing all sediment to collect under the strainer without being disturbed by the force of the suction. A foot valve is also provided inside the strainer which closes the instant the strainer ceases operating, holding all water in the pipes, all primed for starting instantly, at the next filling of the sump.

The Penberthy Automatic Cellar Drainer is particularly adapted for use in pits, sumps, cellars, tanks, settling basins, or wherever it is desired to keep water or other liquids from going above a certain level. It is more efficient, takes up less room, will last much longer, and sells at a lower price than asked for many drainers not as efficient. They are made of best bronze metal, except the float which is copper. They can be regulated for any water pressure.

DUTY TO SAFEGUARD GEARING OF PIPE-THREADING MACHINE AND LIABILITY FOR INJURY TO BOY.

A boy 14½ years of age, who had worked six months for a Michigan company that was a manufacturer and dealer in plumbers' specialties, was set to work on a pipe-threading machine and, while returning from another part of the shop, where he had gone to get a drink of water, tripped over a valve lying upon the floor and lost part of his left hand by falling upon the exposed gears or cogs of the machine. In affirming a judgment for $1,500 damages in his favor, the Supreme Court of Michigan holds, Tabinski vs. Company, 134 Northwestern Reporter, 653, that, under the Michigan statute, the decision of the factory inspector that the gears were not so exposed as to require a guard was not conclusive. A glance at the machine showed that it was operated by means of two sets of gears, and the statute provides that "all gearing or belting shall be provided with proper safeguards". That the mechanism here considered came within the definition of "gearing" could not be doubted. Here, then, was a positive duty imposed on the employer, a breach of which would render it liable if, by reason of such breach, injury resulted to a child exercising due care at the time of the accident. It seems to the court sufficiently obvious that the controlling motive in the various enactments was to throw certain safeguards about young children who, by reason of their circumstances, are obliged to seek employment while yet immature and inexperienced. All employment is not prohibited, but only such as may be considered dangerous to life and limb. No definite standard is set; no hard and fast rule is enunciated. In doubtful cases, the responsibility is placed upon the employer who, if harm comes to the child, that child at the moment of injury exercising such reasonable care and prudence as his age will permit, must feel able to satisfy a jury that such employment does not come within the prohibition of the statute.

Belvidere, Ill.—Leonard & Henigan is the style of a new firm which has just opened a plumbing and heating establishment here.

News of the Plumbing and Heating Contractors

Reports of the Week from Many Different Cities Show Both Business and Personal Activity in the Trade

NEWS FROM NEW ENGLAND.

Massachusetts.

Springfield.—The city property committee has awarded the contract for installing a vacuum heating system in the Chestnut street school, to the C. A. Albe Plumbing Co., whose bid of $1,198 was $200 lower than any of the others received.

Quincy.—Albert Damon, of the plumbing firm of Sanborn & Damon, has recovered from a serious illness and is attending to his business again as usual.

Amesbury.—Peter Thompson has been awarded the contract to heat and ventilate the Whittier school building.

Marion.—The town has appropriated $3,500 for the installation of a new heating system and other work at the South school. A modern ventilating system will also be installed.

Winchester.—A new heating and ventilating system is to be installed in the town hall building at a cost of $2,000. The selectmen will have charge of the work.

Chicopee.—Galvin & Moriarty, manufacturers of steam heating apparatus and steamfitters' supplies, have purchased a tract of land in Williamsett and will erect a new factory building. The concern is now located in Holyoke but has outgrown its quarters.

Connecticut.

Willimantic.—Hollis H. Lyman of this city has been awarded the contract to install plumbing and heating plants in the new Booth-Dimock library at South Coventry.

Hartford.—William A. Murray has opened an up-to-date plumbing establishment at 252 Smith street, West Hartford. Mr. Murray has been in the business in Hartford for the past sixteen years and is known as an expert in plumbing and heating.

New Canaan.—The Henry Plumbing Co. has many contracts on hand at the present time. The concern has just finished plumbing and heating a house for D. I. Tompkins; has the contract to install three bath rooms in the residence of P. J. Colbron, a bath room in a house on Richmond hill for Mead Brothers, metal work on Robert Ellwood's house on Green avenue, plumbing work in a double house on Green avenue for William Dawless, plumbing work in a house on Locust avenue for Horace Johnson, plumbing work on H. H. Mead's residence on South avenue, and plumbing, heating and metal work in the Silliman block, on Main street.

New Haven.—S. Lyman & Co. have the contract for installing new plumbing in a house on Elliot street for Mayer Swirsky; plumbing a brick tenement house on Waverly street for Max Rosoff, plumbing a dwelling house on Putnam street for Columbo & Cavarallo, and plumbing a new two-family house on Linden street for I. Sugenheimer.

New Haven.—The contract for plumbing and heating the new Bishop residence on Bishop street has been placed with William Keane & Son.

New Haven.—H. Kravet has the contract for plumbing and metal work on two six-apartment houses on Admiral and Winter streets, for A. D. Hoppmann.

Rhode Island.

Providence.—School heating and ventilating contracts have been awarded as follows: Heating and ventilating the Daniel Avenue school, William E. Doherty, $1,509. Heating and ventilating Roosevelt Street school, Haslam Heating & Ventilating Co., $3,497. Heating and ventilating Ruggles Street school, Cox & Stone, $1,295. Heating and ventilating Smith Street school, Cox & Stone.

New Hampshire.

Dover.—George C. Randall has been awarded the contract for installing the heating system in a new house on Glenwood avenue for William Holden.

NEWS FROM PHILADELPHIA AND VICINITY.

Harry Bucheler, 3623 Germantown avenue, Philadelphia, in addition to his large jobbing trade is installing the plumbing in two houses at Bristol and Broad streets, Philadelphia, for Harry Ellenberg.

D. V. Kennedy, 837 E. Chelten avenue, one of Germantown's prominent plumbers, will install the plumbing in the Fern Rock Lyceum, 5824 Park avenue, Philadelphia.

George F. Uber & Co., corner 13th and Fairmount avenues, Philadelphia, have the contract for plumbing at southwest corner Juniper and Vine streets, Philadelphia, for Goodman Bros.

Wm. Mayberry, 530 Walnut street, Philadelphia, will install drainage systems at 1921 and 1943 Wilder street, for Mrs. E. H. Keefer.

S. Louis Barnes, the Popular Secretary of the Master Plumbers' Association of Philadelphia.

G. B. Mardin, 1326 North 52nd street, Philadelphia, is installing plumbing in the new residence of W. Bechmann at Conastoga and Thompson streets, Philadelphia.

H. Freedman, 1608 S. 5th street, Philadelphia, has the contract for plumbing at 4104 Lancaster avenue, Philadelphia, for Hopkins Milgrims.

Robt. M. Platt, 4542 Richmond street, Philadelphia, is one of the busy plumbers of this city. In addition to other contracts he will install drainage systems at 4639-41 Cambridge street, for F. Sewandousk; 4557-59 Stiles street for M. Suzzko; 2388-90 Duncan street, for Thos. Dabrowski.

Fred. B. Speth, 3531 N. 5th street, Philadelphia, will install plumbing in two houses on Gale street, for W. Reigel.

Thos. J. Mulholland, 3835 Lancaster avenue, Philadelphia, has the contract to install plumbing in the Church of Christ, located at Brown and 51st streets, Philadelphia.

E. Quindlin, 1412 S. 20th street, Philadelphia, will make additions and sewer connections in 1224-36 S. 21st street and 2238 Oakford street, Philadelphia.

L. Wanner, jr., 33 S. 17th street, Philadelphia, has the contract for plumbing in the residence of E. L. Kloff at 8th street and Oak Lane. He is also installing the plumbing at 2126 to 30 Market street for Frank Hardart.

Wm. P. Gould, 338 E. Somerset street, Philadelphia, will introduce sewage systems in 11 houses, 2855 to 75 Stroughton street, Philadelphia, for F. P. Buckley.

W. H. McClain, 5922 Girard avenue, Philadelphia, has the contract for plumbing in 4 houses, 5410-16 Haverford avenue, Philadelphia, for C. White & Bros.

W. H. Zimmerman, 1219 Arch street, Philadelphia, has been awarded the contract for the plumbing in the residence of M. A. Simpson at 61st and Jefferson streets, Philadelphia.

NEWS FROM THE PACIFIC COAST.

San Francisco.

Though the general opinion seems to be that this is a rather quiet summer in almost all lines of business, yet when statistics are consulted it is found that the improvement over a year ago is marked, especially in the building trades. In fact there has been a steady increase in building activities in the past three years. The country is growing, not by leaps and bounds, but sanely and steadily, and conditions on the Coast are undoubtedly somewhat better than elsewhere in the country. The field here is amply supplied with business enterprises to care for the market that exists, except in the matter of home manufacturing, and if new concerns do not enter this field faster than the normal expansion of the market warrants, another year ought to see business on a splendid basis. As for home manufacturing, this is bound to come when labor conditions throughout the country are more equal, ready access to raw materials permitting, and the region is more thickly settled.

The record of building permits for June shows a slight falling off, as is but natural at this stage of the summer, but nevertheless the valuations are encouraging and point to continued building activity for months to come. The permits issued in June in San Francisco amount to $2,054,542, about $175,000 less than May, and slightly more than June, 1911. Los Angeles comes forward with the largest figure of the year, her permits for June being: $3,488,337, over a million dollars greater than May, and over half a million larger than June, 1911. In spite of considerable labor trouble, there are very extensive building operations in Los Angeles. Portland's permits for June aggregate $1,176,605, or about $250,000 less than May, and almost $700,000 less than June, 1911. Oakland's permits for June amount to $758,430, or about half a million less than May, and $100,000 more than June, 1911. San Diego shows permits to the value of $669,163 for June, or about $150,000 less than May, and slightly more than June, 1911. Sacramento's permits for June amount to $157,107, a slight decrease from May and a slight increase over June, 1911.

The Wolverine Brass Works are at present engaged in taking inventory. Though copper prices have been advancing steadily, this company has not raised its prices on the Coast as yet, but it is expected that higher rates must be charged soon.

Francis Baker, general manager of the George H. Tay Co., is at present in Reno, Nev., on business for the company.

H. W. Finch, Pacific Coast manager for J. M. Kohler Sons Co., has returned from his southern trip. He reports very successful business in San Diego.

The Contractors & Dealers' Association, which was organized some months ago to promote greater harmony in the building trades in California and to remedy certain evils of the general contract system, has just issued the first number of its official organ, "The Contractors & Dealers' Journal." The paper is published at Sacramento, the headquarters of the Association.

The Turner Co. has been awarded the steam heating and hot water supply system contract on the Sierra Investment Co.'s concrete and wood building at Brady and Market streets; amount $2,300; also the plumbing and gasfitting contract on the same building; amount $10,000.

Willard C. Chamberlain, Pacific Coast manager for the Standard Sanitary Manufacturing Co., who returned a few days ago from a trip to the Northwest, has now gone to visit his southern territory. H. L. Allison, special representative for the company, leaves this week for the north.

On the alteration job on the Dooley building at Sutter and Hyde streets, Mangrum & Otter were given the steam heating work; amount $860; and The Central Electric, Plumbing & Heating Co., secured the contract for the plumbing.

O. Davis has been awarded the contract for the plumbing, heating and hot water system for the three-story Samuels building on Bush near Mason street. Amount of contract, $2,000.

S. Kindler, the well known contracting plumber of San Diego, Cal., is visiting in San Francisco this week.

The Peterson-James Co. has been awarded the steam heating contract on the Metcalfe building on Geary, near Mason street. Amount, $2,600.

The E. O. Nay Co., of Pasadena, Cal., has been awarded the plumbing contract, amount $4,111, on the three-story, fourteen-room residence for Peter Hall, 769 No. Marengo avenue, Pasadena.

The contract for the construction of improvements on the city water plant at Salmon City, Idaho, has been awarded to the Vogler Plumbing & Heating Co. of Salmon City. Amount of contract, $24,250.

NEWS FROM WISCONSIN.

Oshkosh.—The common council has awarded the contract for the plumbing work in the city's building, at 62 Algoma street, to Mueller Bros.

Wausau.—The city engineering department has completed preliminary plans for the construction of various sewers in this city. Bids are being called for the work of construction. Eight, ten and twelve-inch pipe sewers, amounting to about 2,000 feet, will be installed.

Appleton.—Until July 15, sealed bids will be received by E. L. Williams, city clerk, for the construction of a sewer in the big ravine from the right of way of the railroad to Packard avenue, and connecting same with present system.

Milwaukee.—A sewerage and water system is to be installed in the Milwaukee County School of Agriculture and Domestic Economy, at Wauwatosa. Bids for the work are being received by the county clerk, Martin Plehn.

Green Bay.—The board of education has awarded the contracts for the heating systems on the New Howe and Woelz schools here. The lowest bids for both jobs were those of the Thomas Heating Co., of Racine. Its bids were $14,285 for the Howe and $6,747 for the Woelz buildings, or $20,587 for both jobs. The cost will therefore be $20,587.

La Crosse.—Six of the plumbing firms of this city have signed a protest, which has been sent to the board of public works, in regard to the annual fee of $2 charged for a plumber's license. The objectors claim that there are individuals engaged in the plumbing business in this city who are not paying the tax demanded by the ordinance, and this, it is alleged, constitutes a discrimination against them.

Stevens Point.—The partnership of C. E. Knapp and H. J. and J. H. Finch, known as the Stevens Point Plumbing and Heating Co., has been dissolved. Mr. Knapp has rented the Adams building on Division Street, and will conduct a similar business there. The Stevens Point Plumbing and Heating Co. will hereafter be conducted by Mr. H. J. and Mr. J. H. Finch.

La Crosse.—The common council has ordered the board of public work to advertise for bids for installing of sewer extensions in the south end of the city. City Engineer George P. Bradish has estimated the cost to be $15,833.21. The extensions will be laid in Farnam, Denton and Green Bay Streets and West Avenue.

NEWS FROM COLUMBUS, OHIO.

The contract for the hot water heating plant for the Ohio State University, in Columbus, has been awarded by the board of trustees to Evans, Almirall & Co., of Chicago. Consideration, $18,956.

The contract for the plumbing and heating for the large addition to the Masonic Temple, on North Fourth street will be awarded in the near future.

The Roberts Plumbing Co., Columbus, has been awarded the contract for the plumbing and heating apparatus for the three-story addition to the John W. Brown Manufacturing Co., in that city.

CONTRACTS AWARDED.

Chattanooga, Tenn.—Knoedler & Meredith have been awarded contracts for the plumbing and heating in two Polk County schools, one located at Benton and the other at Ducktown; also in the apartment building and store of the Inman Street Realty Co., of Cleveland, Tenn. Mr. John Knoedler will supervise these installations.

Wadena, Minn.—Contract for plumbing and heating in the new school house being erected by the United States here, has been secured by J. M. Robb & Co. Amount, about $1,000. This concern has also been awarded the contract for installing the plumbing and heating system in the new government hospital on the White Earth reservation, at a figure of $4,100.

Fulton, Ill.—J. C. Reagan has been awarded the contract of furnishing and installing a steam heating plant in the new high school building, district No. 111. The price specified in the contract was $2,200.

Ishpeming, Mich.—The Lake Superior Heating Co. of this city has been awarded the contract for installing the heating plant in the new fire hall in this city.

Mt. Pleasant, Utah.—G. F. Bohne is installing a modern heating and plumbing system in the residence of John Gunderson, also in the home of Joseph Seeley.

Schenectady, N. Y.—The contract for plumbing and heating of the county jail has been awarded to Kalteux-Frank Co. of this city, the lowest of four bidders. The contract price is $9,866.

GOVERNMENT CONTRACTS TO BE AWARDED.

Acting Supervising Architect James A. Wetmore, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

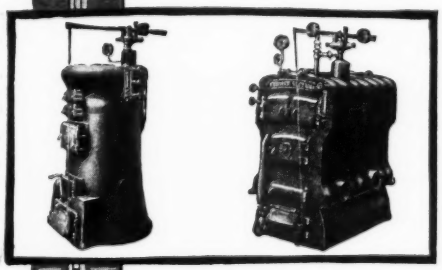
Until 3 p. m., on August 2, 1912, for the construction (including plumbing, heating apparatus, gas piping, electric conduits and wiring, and interior lighting fixtures) of the extension, remodeling, etc., of the United States post office and courthouse at Charlotte, N. C. The extension is two stories and basement, stone faced, of fireproof construction (except roof) and has a ground area of approximately 12,600 square feet.

Until 3 p. m., on August 5, 1912, for the construction, complete (including plumbing, gas piping, heating apparatus, electric conduits and wiring, interior lighting fixtures, and approaches) of the United States post office at Marshall, Mo. The building is one story and basement and has a ground area of approximately 4,900 square feet; fireproof first floor; stone facing and tin roof.

Until 3 p. m., on July 22, 1912, for the construction (including plumbing, gas piping, heating apparatus, electric conduits and wiring, interior lighting fixtures and approaches) of the United States post office at Hanover, Pa. The building is of one story, basement and mezzanine and has a ground area of approximately 4,900 square feet; fireproof construction throughout; stone facing, and copper roof.

All proposals should be in accordance with drawings and specifications, copies of which may be obtained from the custodians of the above sites, or from the Acting Supervising Architect at Washington, D. C.

UNITED STATES RADIATORS AND BOILERS



are built with a knowledge to secure from each pound of fuel in the firepot the greatest number of heat units. They insure the owner with fuel economy.

They produce that warm, balmy atmosphere that protects health of old and young.

United States Radiators are made in many designs to meet every purpose—from severely plain to those highly ornamented. They are clean, sanitary and durable in construction, because they are built of the best possible grade of cast iron.

Write today for THE COMPLETE LINE Catalogue on boilers, radiators, and heating specialties.

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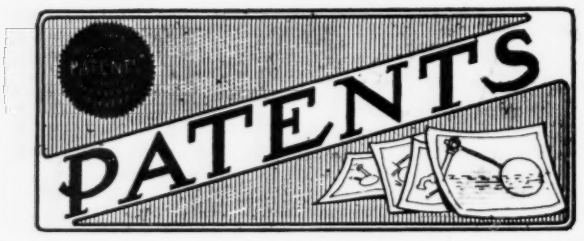
Branch Offices and Show Rooms

New York	3-5-7 West 29th Street	Pittsburgh	4th Avenue and Wood Street	Detroit	139 Jefferson Avenue
Boston	236 Congress Street	Buffalo	Fidelity Trust Building	Minneapolis	901 Washington Avenue, So
Philadelphia	122 North 13th Street	Cleveland	1419 Schofield Building	St. Louis	14th and Pine Streets
Washington, D. C.	Metropolitan Bank Building	Chicago	184 North Dearborn Street	Omaha	916 Farnam Street
Baltimore	09 North Howard Street			Kansas City	220 East 10th Street

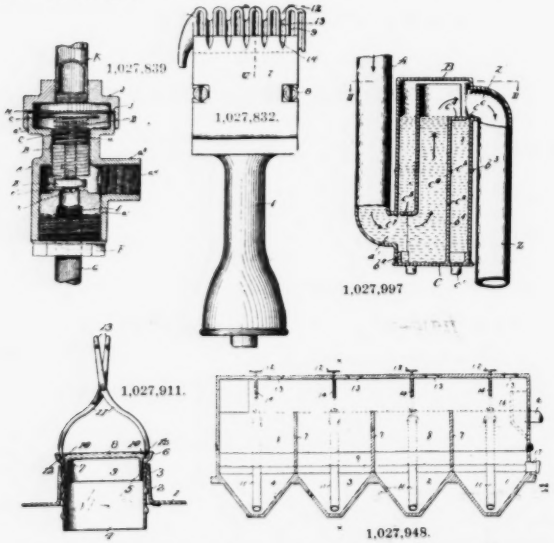


Plumbing Department.

1,027,839. Automatic Valve. Elmer E. Graham, Erie, Pa. In a device of the character described, a valve shell, having a longitudinal valve stem-opening through the center thereof, a valve stem in said opening, a diaphragm closing the upper end of said valve shell, a cap on the upper end of said shell above and securing said diaphragm in place thereon, a valve on the lower end of said valve stem, spring mechanism within said shell adapted to press upward against said diaphgram, a removable plug in the lower end of said valve shell, having a longitudinal opening therethrough, and a valve seat on the upper end of said plug surrounding said opening therethrough, upon which said valve may seat, substantially as set forth.

1,027,832. Burner. Reynolds C. Frampton, Pittsburgh, Pa., assignor to Pittsburgh Water Heater Co., Pittsburgh, Pa., a corporation of New Jersey. In combination in a burner, a discharge chamber having closed ends, and open sides, perforate siding covering the sides, side plates secured over the perforate siding and spaced away there from, and a cap plate fitting between the upper edges of the side plates and provided on each side with a plurality of diagonal tapering passages decreasing in size from their inner to their outer ends.

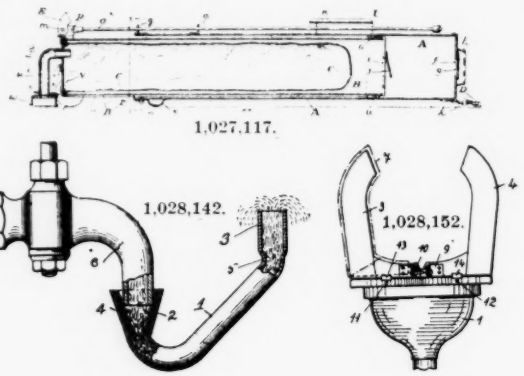
1,027,997. Sewer-Gas Trap. Frank E. Cudell, Cleveland, O. A sewer-gas trap comprising the combinaiton of a pot provided with upper and lower openings, and an interiorly positioned duct communication with said openings and with said pot, said duct having flared portions adjacent said openings.



1,027,911. Service or Valve Box. Gerard Schumacher, Anniston, Ala. A service or valve box, or the like, having an opening surrounded by a vertical wall having a cover-receiving seat slightly below the opening, in combination with a cover fitted down in said seat and having elongated means depending within and snugly fitting said wall to confine the cover against removal except by extensive vertical movement parallel with the axis of said opening, said cover formed with diametrically-opposite edge recesses adapted to receive only a special, removable cover-lifting implement, by which implement alone the cover can be lifted.

1,027,948. Sewage-Disposal Plant. Albert H. Wehr, Mount Washington, Md. A plurality of intercommunicating tanks, the first one of which has an inlet and outlet, a central wall extending the full length of all of said tanks and projecting from the top to near the bottom thereof and partly cut away in the last tank, and two walls extending the full length of all of said tanks and projecting from the top thereof and converging toward the central wall and terminating above the lower end of the latter.

1,027,117. Vacuum-Cleaner. William R. Fowler, Baltimore, Md. In a vacuum cleaner the combination of an outercylinder in a horizontal position having one end closed and provided with a valve; a foot-piece to rest on the floor and flexibly attached at the closed end of said outer cylinder; an interior cylinder fitting like a piston within the outer cylinder and reciprocable therein; a flexible bag-shaped dust collector in said interior cylinder; an inlet-nozzle carried at the outermost end of said interior cylinder and adapted to contact with the surface of the floor as said cylinder reciprocates; and an actuating rod-handle attached to the outermost end of said reciprocable cylinder.



1,028,142. Sanitary Drinking Device. Alonzo D. Seaman, Milwaukee, Wis. A portable sanitary drinking device having a flared end adapted to fit over a faucet or pipe to make a water-tight connection therewith by manual pressure directed in the line of the discharge, and having means for directing the stream of water from said faucet or pipe in an upwardly direction.

1,028,152. Seat. Fritz Treude, Berlin, Germany. In a water closet, the combination with a bowl thereof, of two hinged seat portions mounted on the bowl having the axes of the hinges angularly disposed to cause the portions to approach and form a seat when they are down and to separate when they are turned upwardly, and means for connecting said portions to enable them to be lifted and lowered simultaneously.

NEW PUBLIC COMFORT STATIONS.

Plans have been made for the construction of a public comfort station to be erected at the foot of Main Street, Little Rock, Ark. Superintendent H. Levinson is estimating upon the cost of its construction, and it is expected that he will report to the city council at its next meeting.

The first public comfort station to be constructed in Portland, Ore., will be located underground at the northeast corner of Sixth and Yamhill Streets, and it will cost about $15,000. Plans for the station are now being prepared by Architect E. F. Lawrence. The station will be 50 feet long on Sixth Street and 50 feet long on Yamhill Street, and will be L-shaped. It will be of sufficient width to accommodate a large number of persons. Plans for the station will be ready soon. It is expected that the station will be completed by fall. Mr. Lawrence will also prepare plans for a similar station to be installed at Kenilworth Park. Other stations will in the near future be constructed in different parts of the city at the direction of the city council.